

Requirements for Electric Service Connection

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Welcome to the Seattle City Light Requirements for Electric Service Connection. This handbook is designed for use by City Light customers, contractors, and electricians to explain utility requirements for a variety of electric service installations.



Mike Haynes, Chief Operating Officer

Seattle City Light
Requirements for Electric Service Connection

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1. Getting Started: Applying for Electric Service

1.1. Introduction

This chapter outlines the process for applying for service and securing all permits and inspections, as well as provides a timeline of average turnaround times to complete the application process.

A collection of construction and material standards related to electric service can be found at <http://www.seattle.gov/light/engineerstd/ElectricalSvc.aspx>.

1.2. Service Areas

A map of the City Light service area can be found at seattle.gov/light/electricservice/map.asp. Customers will be assigned a City Light Representative based on the location and complexity of the project.

City Light has two categories of distribution: Looped Radial and Network. Network areas include Downtown Seattle, South Lake Union, First Hill, and parts of the University District. Requirements related to the Looped Radial system are discussed in Chapter 3, and requirements related to our Network areas are discussed in Chapter 4.

1.3. Connection Timeline

Table 1.3 shows estimated times required for each phase of the application process. Projects requiring special transformation or line extensions depend in part on equipment availability.

TABLE 1.3. ESTIMATED TURNAROUND TIMES PER PHASE OF APPLICATION PROCESS, LOOPED RADIAL

Service Type	Application Processing	Engineering	Service Connections
Service removal – simple (single-phase, 400 A or less)	1 week	Not applicable	2 weeks
Service removal – complex (three-phase and/or underground)	1 week	4 weeks	2 weeks
Temporary power – simple (single-phase, overhead, 400 A or less)	1 week	Not applicable	2 weeks
Temporary power – complex (three-phase and/or underground)	1 week	4 weeks	2 weeks
Service upgrade – simple (single-phase, overhead, 200 A or less)	1 week	2 weeks	2 weeks
Service upgrade – complex (three-phase and/or underground)	1 week	6 weeks	2 weeks
New service - simple (single-phase, overhead, 400 A or less)	1 week	4 weeks	2 weeks
New service – complex (three-phase and/or underground)	1 week	6-8 weeks	4 weeks*
Line extensions, plat development	1 week	8-10 weeks	8 weeks*

* Add up to five weeks for non-arterial street permitting, and fifteen weeks for arterial permitting.

Notes:

1. Network projects have unique timelines. For more information, consult your City Light Representative.
2. It is essential that contractors notify City Light well in advance of designing their buildings, as the requirements for a primary service may alter the building design. For instance, City Light may require space not only for the vault, but for a primary switchgear room as well.

1.4. Service Connection

City Light will make service connections only when:

- All applicable City Light requirements have been met
- The customer's responsibilities, as delineated herein, in a service construction letter, in a contract, or via an in-field conversation with a City Light Representative have been fulfilled.
- All City Light inspections have been completed and the project approved.

1.5. Charges

City Light will determine charges for service work based on the size of the service, the service location, and the work required to connect it to our system. Charges must be paid prior to the work being done.

See City Light Departmental Policy and Procedure (DPP) 417 for current connection charges.
--

1.6. Application Process for New or Enlarged Services

1.6.1. Pre-Application Consultation

City Light provides general engineering and service advice prior to application to determine project feasibility and considerations.

Contact information:

Small/Medium Projects

(206) 233-APPS (2777)

Email: applications@seattle.gov

Large Commercial and Industrial Projects

(1 MW demand and greater)

Seattle Municipal Tower

700 5th Avenue

(206) 684-3186

Email: applications@seattle.gov

1.6.2. Application for Electric Service

Customers can apply for electric service using the online Application for Electric Service located at www.seattle.gov/light/newconstruction/

Based on the application's criteria, customers will need to submit a plan package for City Light review and comment.

A typical plan package consists of the following elements:

- Legal Site Plan
- Electrical Site Plan
- Building Elevation Plan
- Riser Diagram
- Load Calculations

Additional documents, such as easements, in-building vault details, street improvement plans and short plat/unit lot subdivision information may be required to complete the project. The City Light Representative assigned to your project will advise customers of any additional documents required.

1.7. Permitting and Inspections

For projects located in the public right-of-way in incorporated King County, which includes Burien, Lake Forest Park, Normandy Park Renton, SeaTac, Seattle, Shoreline, and Tukwila, customers can do all civil construction work. The customer is responsible for securing all required permits and inspections.

For projects located in the public right-of-way in unincorporated King County, which includes Skyway and White Center, City Light is required to do all civil construction work. City Light will acquire the civil construction permits, perform the work, and bill the customer for all related costs including labor, materials, permits, and inspections.

Customers will be responsible for acquiring all local jurisdictional permits and pass required inspections and for verifying permit requirements with their local jurisdiction. The customer must pay all permit and inspection fees. City Light will not connect to the customer's service conductors until the proper code authority has inspected and approved the service for connection.

Note: Electrical permits can only be obtained by customers if they are doing the work themselves.

If the work is being performed by an electrician, the electrician is required to obtain the permit.

Projects requiring engineering services will receive a Service Construction Letter. This letter will contain customer drawings and references to all applicable City Light standards for the project, as well as instructions for arranging City Light inspections.

The requirements stated in the Service Construction Letter will be part of the City Light inspection criteria. The customer is also required to meet all applicable building codes for the city and county jurisdictions in the City Light service area.

1.8. Easements

City Light will secure an easement whenever City Light equipment such as poles, vaults, handholes, conductors, etc. are located on private property in order to serve multiple properties.

1.9. Location of, and Excavation Near, Underground Utilities

Before digging, please contact the Utilities Underground Location Center ("One- Call") at 811 or 1-800-424-5555 at least two business days in advance to locate and mark underground utilities, per state law (RCW 19.122).

All excavations adjacent to City Light poles or other facilities (vaults, handholes, etc.) must comply with WAC 296-155, Part N, Excavation, Trenching and Shoring. Pole protection/supporting systems used while excavating must comply with [WAC 296-155-655](#), General Protection Requirements, item (9) and must not affect the structural integrity of poles while the systems are in place or after the systems have been removed.

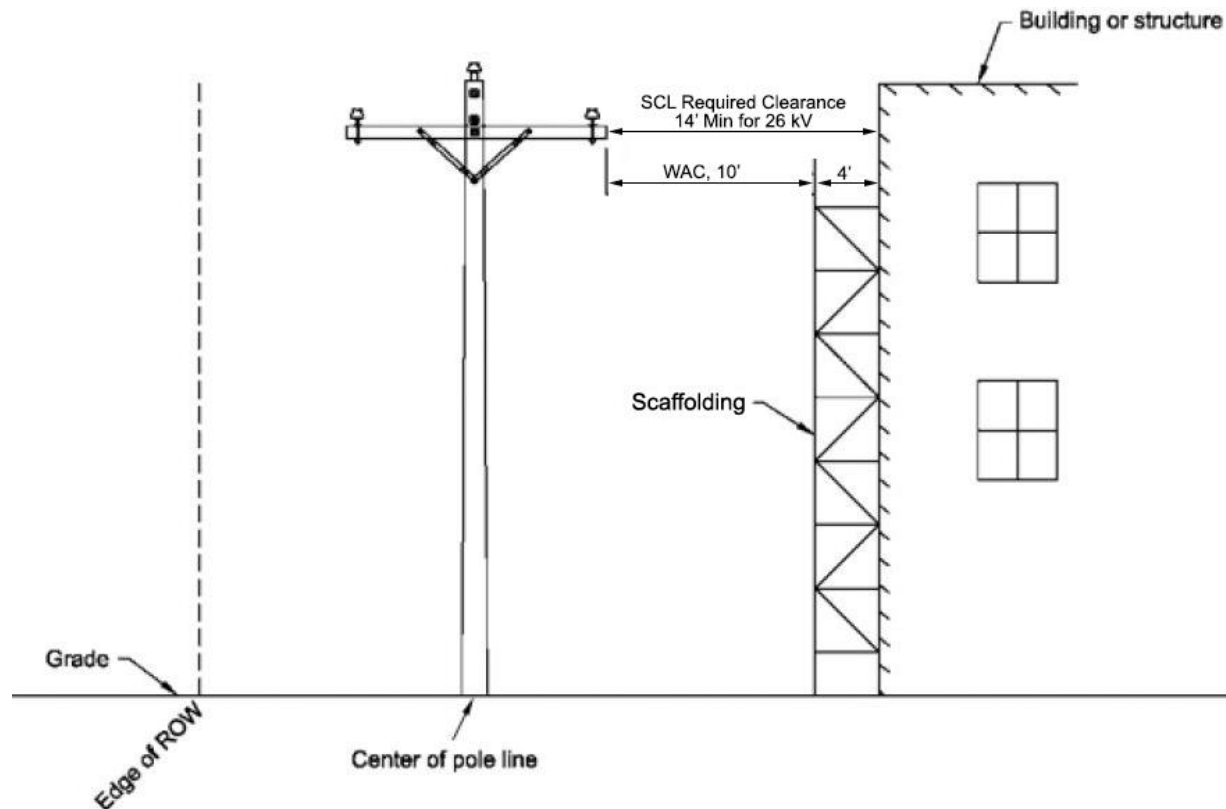
1.10. Clearances

The City Light minimum clearance from the edge of a crossarm to a building is 14 ft. The 14-ft clearance allows for the following:

- Maintenance work environment is safer.
- Building work can occur without taking a clearance outage.
- Qualified electrical workers are not required to perform routine building maintenance.
- Scaffolding can be erected, and other exterior maintenance can occur while meeting the 10-ft rule set by OSHA and WAC.

See Figure 1.10 for clarification.

Figure 1.10. Clearances



City Light transmission lines require even greater clearance. If a project requires work in proximity to any energized lines, we may de-energize and ground the lines, or relocate the lines temporarily. This work will be done at the customer's expense.

See [City Light Construction Standard D2-3](#), "Clearances from Structures and Ground" for more information on overhead clearances and [City Light Construction Standard 0214.00](#), "Clearances Between SCL Underground Structures and Other Structures" for more information on underground clearances.

1.11. Notification of Added Load

Customers who wish to add load to existing service must notify City Light per SMC [21.49](#) (S) and [WAC 480.100.148](#) (1).

1.12. Balanced Load

The customer's three-phase electrical load must be balanced between phases to a level acceptable to City Light. For open-delta services, the customer is required to connect all single-phase loads across the grounded phase.

1.13. Available Fault Current

City Light will provide customer with available fault current upon request. It is the customer's responsibility to provide service entrance equipment designed to handle the available fault current.

1.14. Online Resources

The following City of Seattle resources may be viewed on the Internet:

- [City Light New Construction Website](#)
- [City Light Construction and Material Standards Online](#)

1.15. Installation of Facilities for Other Utilities

The specifications referenced in this manual do not include facilities for other utilities serving this project.

2. Temporary Services

2.1. Introduction

This chapter provides information on all considerations related to obtaining temporary services, including time limits, permitting and inspections, charges, required equipment, location of service connection, and requirements specific to overhead and underground service.

2.2. Requirements, General

Temporary service locations must be approved by City Light.

The customer must provide temporary service entrance equipment.

2.3. Time Limit

Temporary service installations are limited to a period of one year. An extension may be granted at City Light's discretion.

2.4. Electrical Permits and Inspections

See Section 1.7.

2.5. Charges

See Section 1.5.

2.6. Engineering Requirements for Large Services

Three-phase temporary services and single-phase services greater than 400 A may require City Light engineering design services.

2.7. Temporary Overhead Service

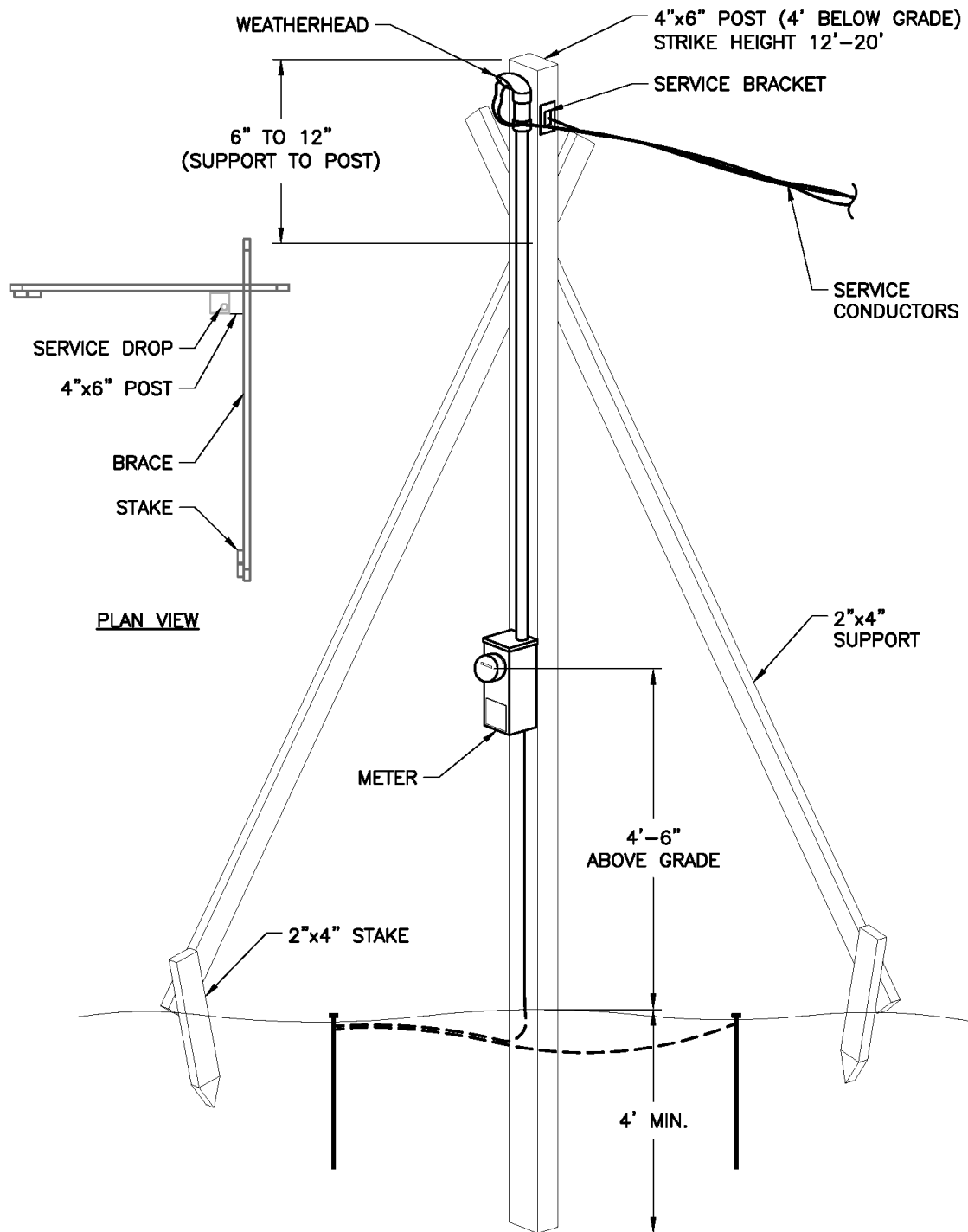
The service attachment must be able to withstand the strain of the service drop. Specifications for temporary posts are shown in Figure 2.7.

The neutral wire must be identified with white tape.

For three-phase, open-delta service, the high leg must be identified with orange tape.

A total of 18 inches of conductor must extend out of the weatherhead.

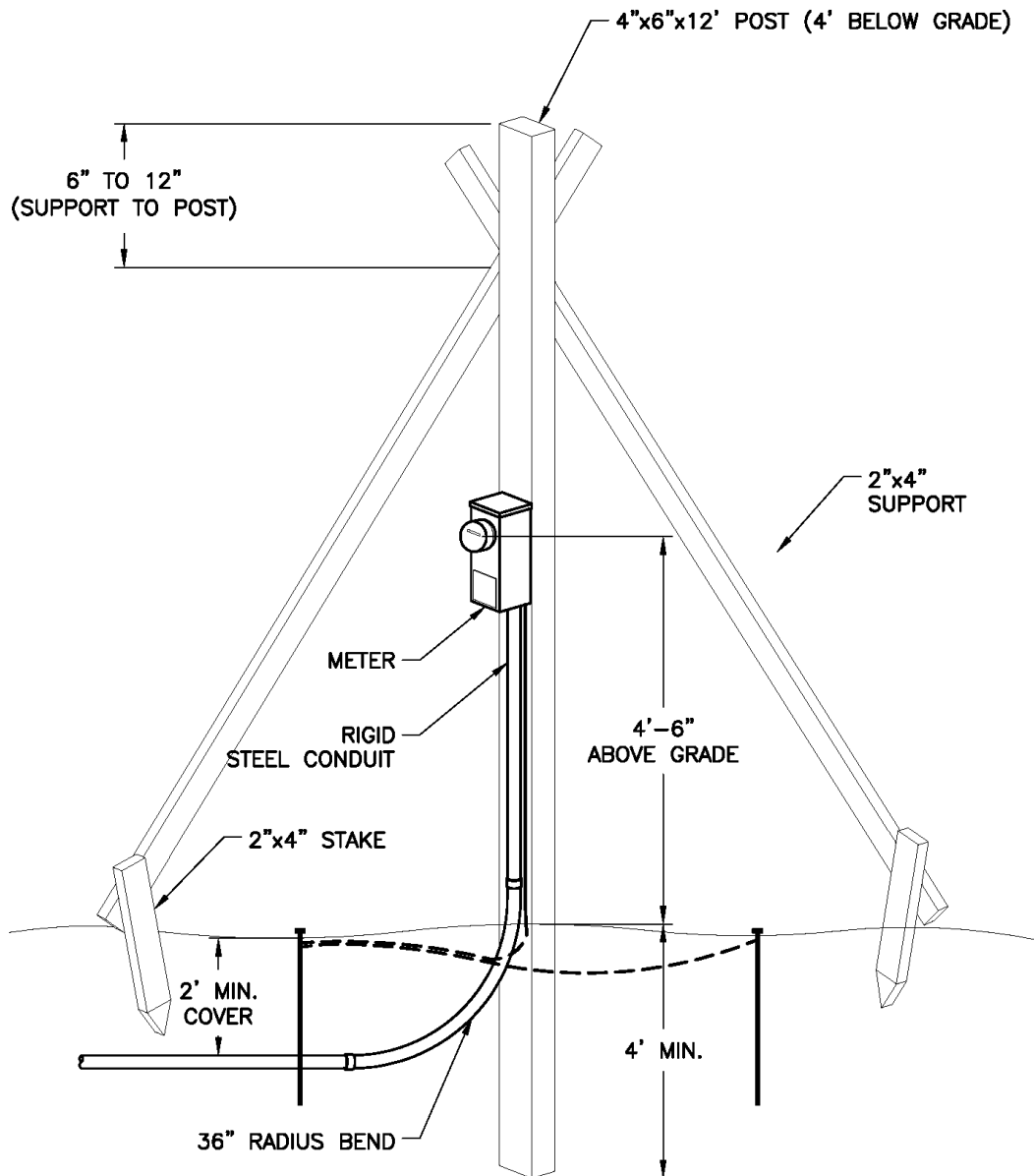
Figure 2.7. Typical Overhead Temporary Service Pole



2.8. Temporary Underground Service

Customer must install a conduit riser at the temporary panel location and trench to the City Light-designated service stub, handhole, vault, or service pole. Figure 2.8 shows the basic pole and trench specifications.

Figure 2.8. Typical Underground Temporary Service Pole



For more information on underground service on private property, See [City Light Construction Standard 0224.01](#), "Customer Requirements for Underground Secondary Service, Looped Radial System" and [City Light Construction Standard 0224.07](#), "Requirements for Secondary Conduit Installation"

3. Looped Radial Service

3.1. Introduction

“Looped Radial” refers to the City Light distribution system that comprises the entire service territory outside of the Network areas. It has underground service and underground areas (such as business districts and certain residential areas), but the primary source of wires that feed these customers are from overhead distribution poles.

3.2. Single Service Rule

This rule states that City Light will provide only one service to a site or building. Additional services will be supplied only at City Light’s option and will be agreed to in writing. If City Light needs to add equipment to the distribution system to provide a second service, the customer will be billed the full cost of that addition, including the equipment.

3.3. Available Service Voltages and Maximum Secondary Service Entrance Ratings

Table 3.3 shows the available service voltages and corresponding maximum secondary service entrance ratings for service in the Looped Radial system

TABLE 3.3. AVAILABLE SERVICE VOLTAGES AND MAXIMUM SECONDARY SERVICE ENTRANCE RATINGS		
Single-Phase Service Voltage (V)	Service	Maximum Secondary Service Rating (A) ^b
120/240	Primary and Secondary	600
240/480	Primary and Secondary	300
Three-Phase Service Voltage (V)		
120/208Y	Primary and Secondary	1000
120/240 Open Delta ^a	Primary and Secondary	600
277/480Y	Primary and Secondary	600
240/480 Open Delta ^a	Primary and Secondary	300
2400/4160Y	Primary only	Not applicable
7960/13,800Y	Primary only	Not applicable
15,420/26,400Y	Primary only	Not applicable

^a The maximum allowable secondary service ampacities indicated in the table represent the total single-phase and three-phase loads combined. The customer will be required to connect all single-phase loads across the grounded phase, unless otherwise agreed to by City Light.

^b Primary service does not have maximum service ratings.

If service ampacity exceeds 600 A, City Light may require an underground service. At City Light’s option, an exception to the maximum service amperes may be granted for 120/208Y service in buildings that are exclusively for residential occupancy. This exception will be in writing.

Single-phase, three-wire and three-phase, four-wire service can be provided. Three-phase, three-wire service is not available at any voltages.

The service rating must be determined by the nameplate ampere rating of the main service disconnect. In the absence of a single main service disconnect, City Light will determine the service rating by the nameplate rating of the main service bus or the rating of the main bus in the service entrance panel, whichever applies.

In buildings where multiple services are connected from one service drop or service lateral, the service rating for the building will be the aggregate of the individual service ratings.

Services to larger buildings, commercial office buildings and apartment buildings may have large electrical services where the aggregate service entrance capacity exceeds the allowed maximum secondary service size listed in Table 3.3. For these services, the customer must provide a vault or pad on private property for City Light transformer(s) and associated service equipment. See Section 3.7, Primary Service.

Transformers connected to the City Light distribution system will be furnished, installed and maintained by City Light.

If the customer requires a voltage other than the stated standard voltages, the customer must supply the equipment required. All special transformation equipment must be installed on the load side of the meter, unless otherwise agreed to in writing.

Vaults, pads and termination facilities must be furnished by the customer in accordance with City Light standards and other codes pertaining to the corresponding Authority Having Jurisdiction.

3.4. Clearances

All projects must meet the requirements for clearances from utility equipment. See Section 1.10.

3.5. Water Entry Prevention

The customer is responsible for the following measures to avoid water entry into buildings and service equipment:

- System design that considers elevation differences and other factors that would cause a problem. The design should prevent water from entering the building or electrical equipment to prevent electrical hazard or property damage. A City Light Representative can advise the customer in this concern.
- Watertight grouting of conduit where it enters the building, the vault, or the handhole.
- Watertight conduit sealing for customer/contractor installed conductors to prevent water from entering the service conduits.

3.6. Secondary Service

"Secondary service" is defined as service that can be served from a transformer located in the public right-of-way on a pole, on a pad, or in a vault.

Secondary service can be either overhead or underground, single-phase or three-phase.

Most single-family residential service in the City Light system is single-phase; however, there are instances where three-phase service is available.

Some local jurisdictions regulate the type of services allowed within their boundaries (overhead vs. underground). The customer must contact the Authority Having Jurisdiction to verify allowable types of service.

3.6.1. Secondary Overhead Services

Types of secondary overhead service include service mast with and without supporting wires, and wall-mounted.

Neutral must be identified with white tape, high leg identified with orange tape, and three-phase circuits identified appropriately.

The distance between weatherheads served from the same service drop must not exceed 24 inches.

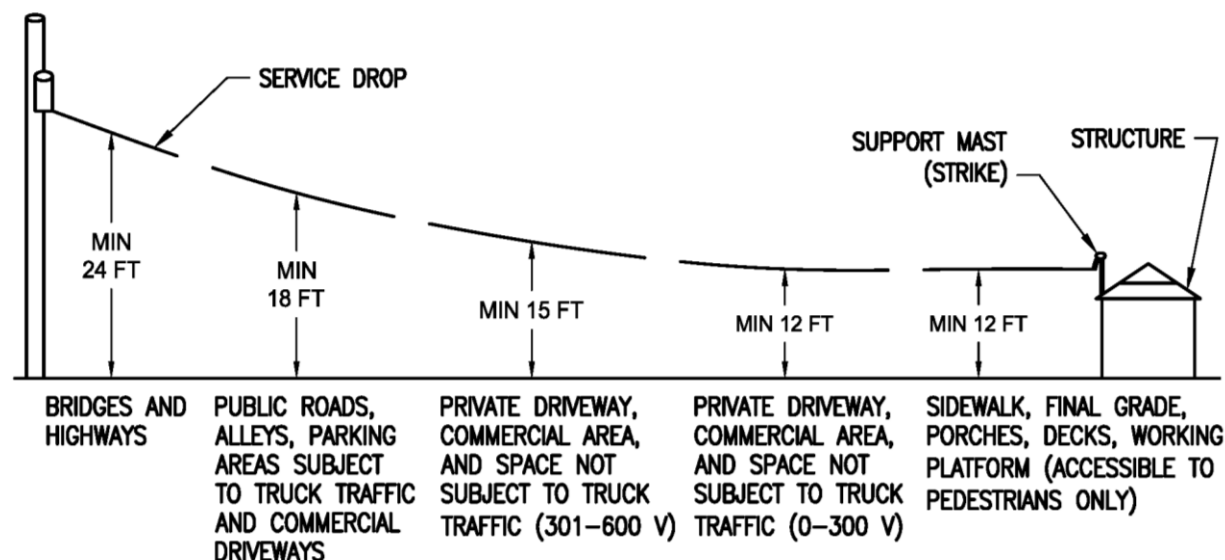
Service entrance conductor sets must have a minimum of 18 inches of wire extending from the weatherhead. If multiple service masts are installed, a minimum of 30 inches of wire must be extended from the weatherhead.

Customer must establish a 3-ft radius of clear space along the path between the utility pole and the strike point on the building.

Service conductors must be free of trespass of neighboring properties.

The point of attachment must be between 12 and 20 ft above grade, with the drip loop a minimum of 11 ft above grade.

Figure 3.6.1. Vertical Clearances in the Spans



For more information on service drops, see [City Light Construction Standard 0130.30](#), "Secondary Service Drops"

3.6.1.1 Service Mast Installation

Service mast installation for overhead service entrances may be surface-mounted or flush-mounted.

The customer must provide all the equipment shown in figures 3.6.1.1a and 3.6.1.1b except the City Light-provided meter, which plugs into the customer's meter socket.

Flush mounted meter sockets require a cover inspection by a City Light Representative. See Figure 3.6.1.1b.

A back guy or a stiff-leg set is required if the height between the top of the weatherhead and where the mast clears the roofline exceeds 26 inches or the service drop exceeds 100 ft. See figures 3.6.1.1c and 3.6.1.1d.

City Light-approved service brackets must be furnished and installed by the customer. Brackets and their attachments need to be capable of withstanding the tension of the service wires. The point of attachment must be between 12 and 20 ft above grade. See Figure 3.6.1.1e.

For service masts where the bracket is attached to the mast, rigid steel conduit with two points of attachment are required. Single-phase services must have a minimum 2-inch conduit, three-phase services must have a minimum 3-inch conduit. The service mast must be within 3 ft of the roof edge.

The service bracket must be a minimum of 18 inches above the roofline, and no closer than 8 inches from the weatherhead.

Roof brackets are not allowed.

Service masts must be attached to the structure at two points at least 2 ft apart.

Attachment methods may include the following:

- Kindorf brackets on the exterior of the building.
- U-bolts into a 2 in x 6 in board mounted to studs.

See figures 3.6.1.1f and 3.6.1.1g.

Roof penetrations (e.g., eaves, fascia, etc.) must not be used as an attachment point.

Figure 3.6.1.1a. Surface-Mounted Service Mast Installation

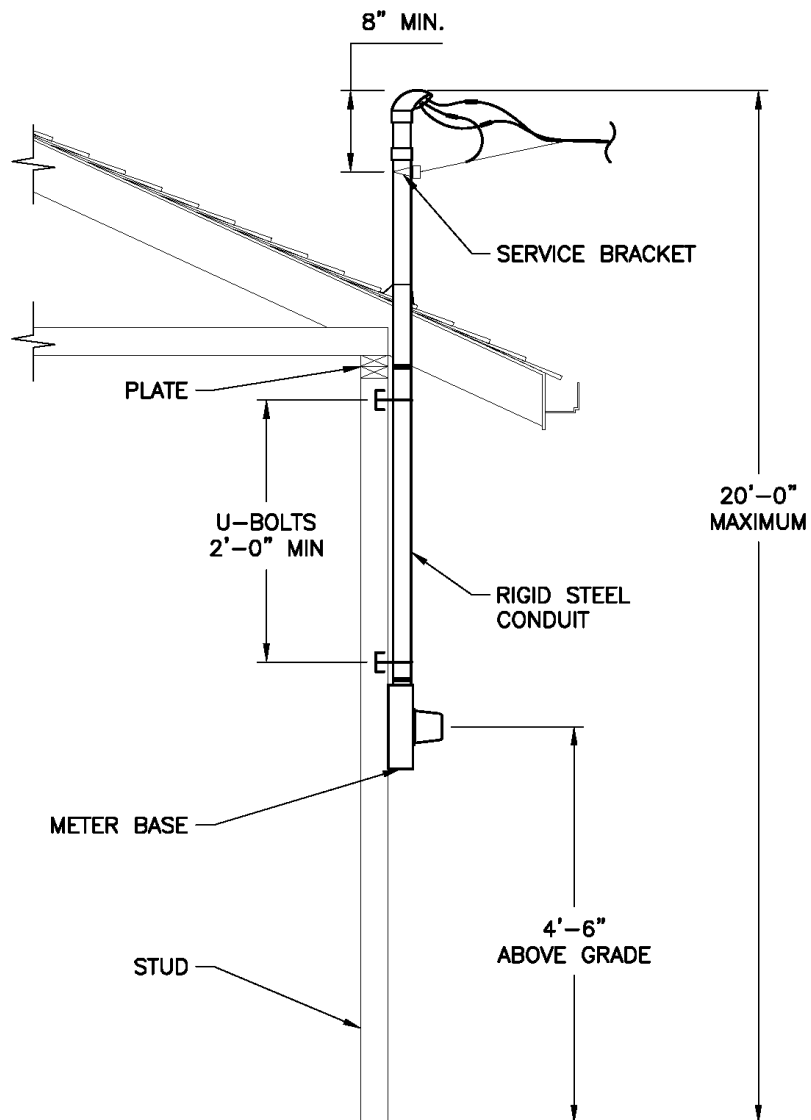


Figure 3.6.1.1b. Flush-Mounted Service Mast Installation

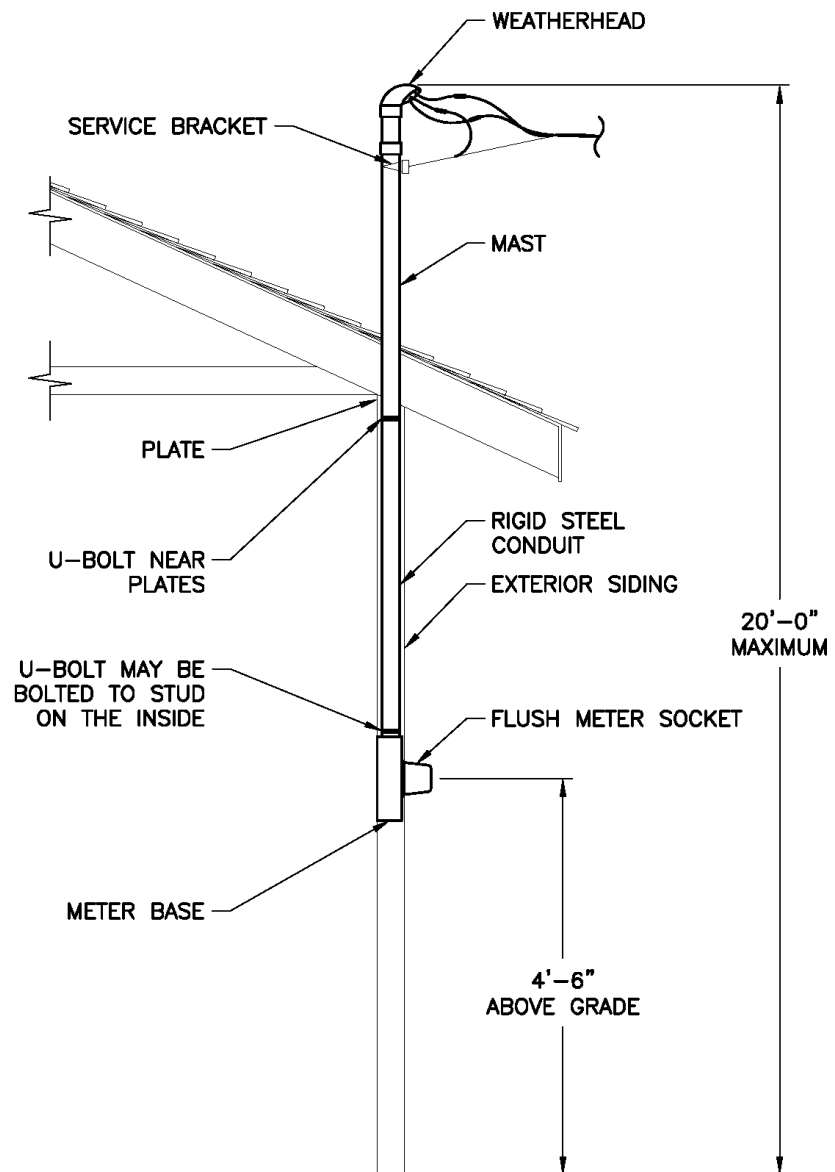


Figure 3.6.1.1c. Back Guy



Figure 3.6.1.1d. Stiff Leg Set



Figure 3.6.1.1.e. Service Bracket



Figure 3.6.1.1f. Kindorf Bracket Attachment



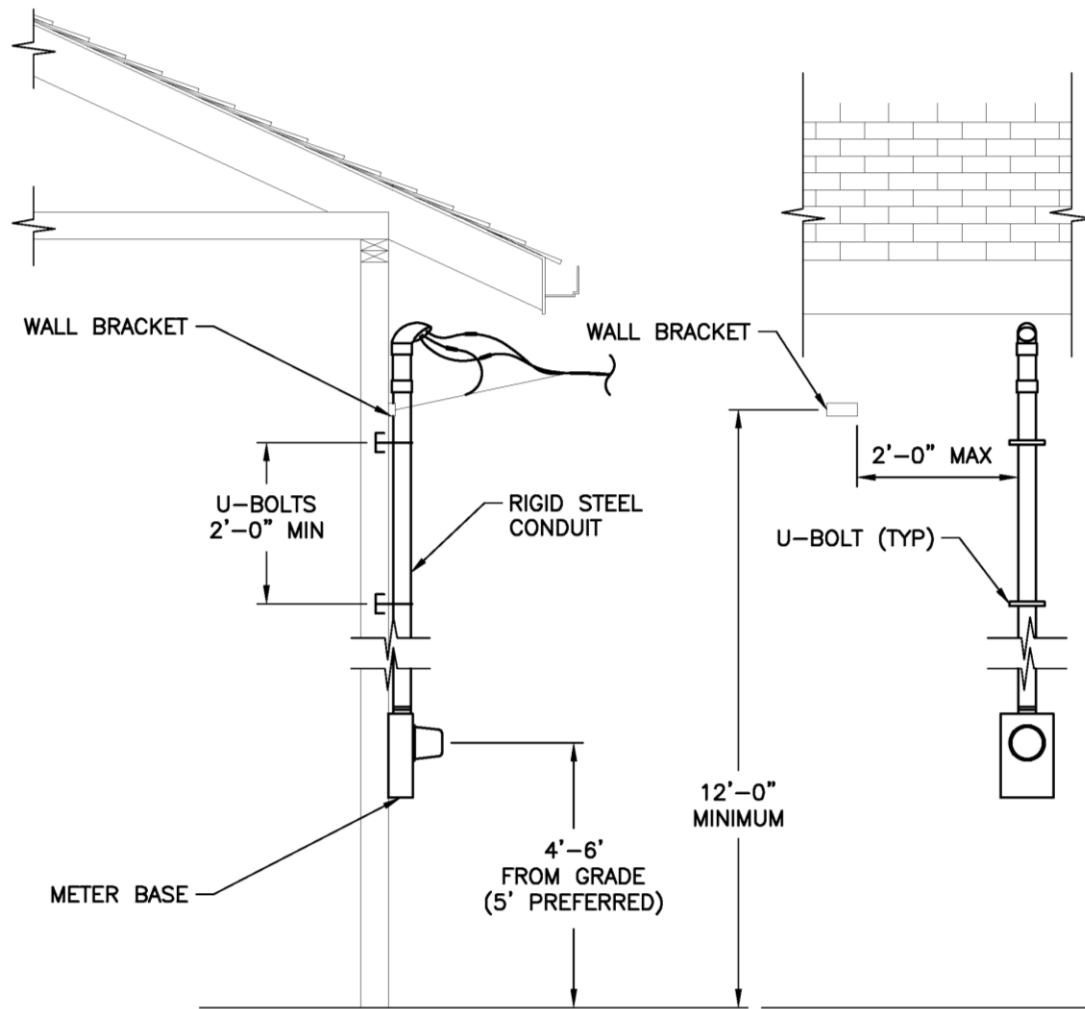
3.6.1.2 Wall-Mounted Service Installation

All wall-mounted service brackets and Kindorf brackets must be secured by lag screws, 3/8 in x 4 in minimum, into solid wood, or 3/8 in bolts through 2 in minimum solid wood.

The point of attachment must be between 12 and 20 ft above grade, with the drip loop a minimum of 11 ft above grade.

The distance from the service bracket to the weatherhead(s) must not exceed 24 inches. See Figure 3.6.1.2.

Figure 3.6.1.2. Wall-Mounted Service Installation



3.6.1.3 Service Poles and Guys

Service poles are: (1) poles that serve only one customer, and (2) are located on the customer's property. City Light may require a service pole on the customer's property where:

- The distance from the City Light distribution pole to the customer's point of service attachment is greater than 150 ft.
- A clear, direct route without trespass is not available for the service drop from the distribution pole to the customer's point of service attachment.

Note: City Light must have a 12 ft-wide access road to set a pole on private property. If this space is not available, services will need to be located underground. See Section 3.6.2.

- The applicable code authority requires a service pole.

City Light will install guys on service poles as needed.

3.6.2. Secondary Underground Services

All equipment must be installed by the customer at the customer's expense. City Light will provide a drawing specifying the route of the conduit required for the installation.

All work associated with trenching, backfill, and restoration must be completed by, and at the expense of, the customer. See Section 1.7.

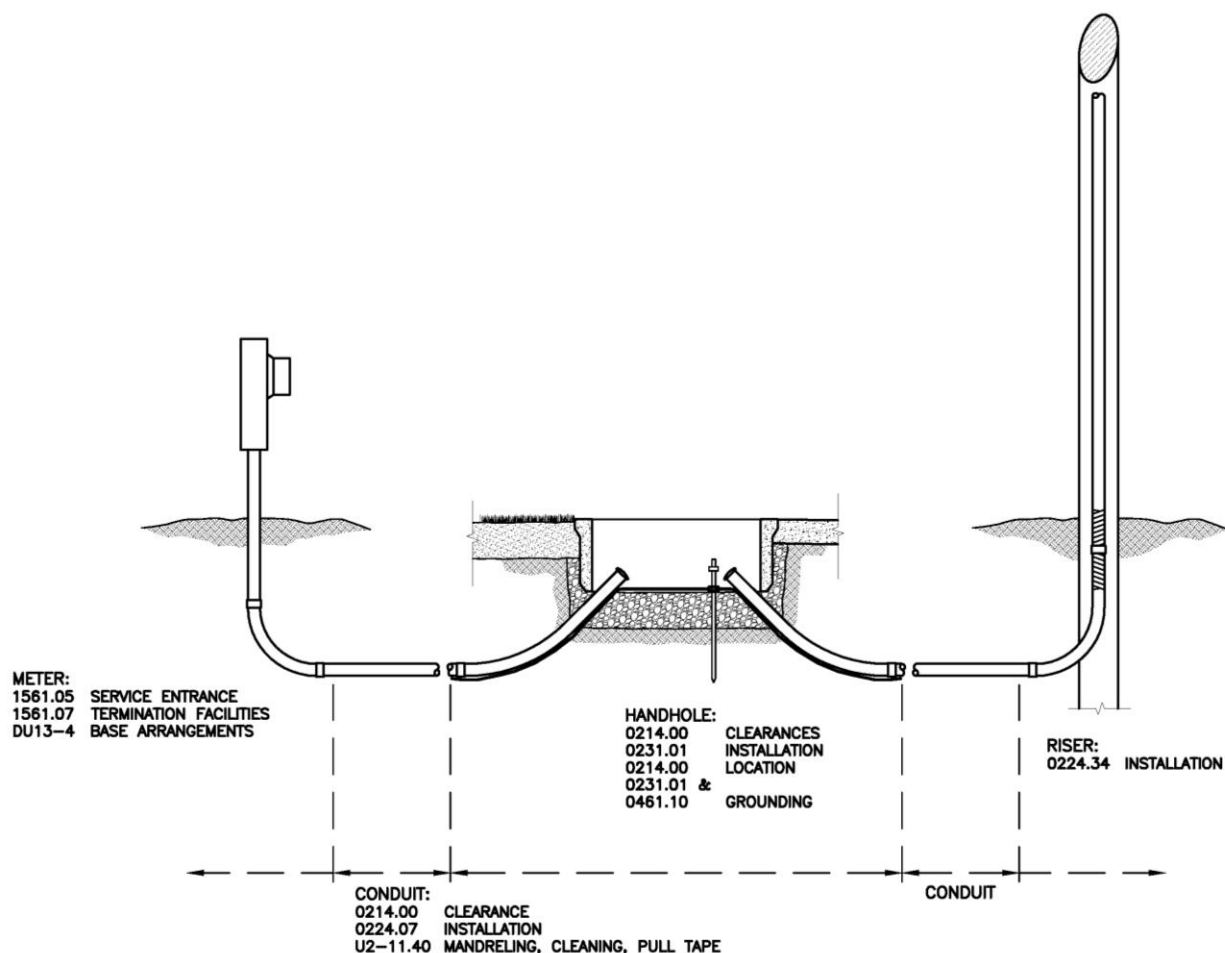
City Light will install the service conductors from the designated point of termination on the customer's property to the City Light facility in the right-of-way or easement area.

It is the customer's responsibility to ensure required clearances between City Light underground structures and other utilities' structures.

A City Light Electrical Reviewer or Underground Crew must supervise the final 5 ft of trenching to any energized City Light vault or handhole.

Figure 3.6.2 provides a visual guide to all the City Light standards that govern the City Light underground secondary service.

Figure 3.6.2. Guide to Underground Secondary Service Standards



For more information on installing secondary underground services, please see [City Light Construction Standard 0224.01](#), "Customer Requirements for Underground Secondary Service, Looped Radial System" for and [City Light Construction Standard 0214.00](#), "Clearances Between SCL Underground Structures and Other Structures"

3.7. Primary Service

Primary service is any service that exceeds the maximum secondary service capacity shown in Table 3.3. These services require transformers or primary metering enclosures to be located in vaults or on pads located on customer's property.

The customer is required to be aware of and satisfy all applicable building codes for the City of Seattle as well as other cities and county jurisdictions in the City Light service area.

Table 3.7 shows the City Light construction standards corresponding to transformer location.

TABLE 3.7. CONSTRUCTION REQUIREMENTS BY TRANSFORMER LOCATION	
Transformer Location	City Light Standards
Vault inside building	SCL 0751.00 , "Customer Requirements, In-Building Transformer Vaults, Network and Looped Radial Systems" SCL 0751.60 , "Concurrent Customer Requirements, In-Building Transformer Vaults"
Vault outside building	SCL 0732.50 , "Customer Requirements for Below-Grade Transformer Service Vaults, Looped Radial System"
Concrete pad outside building	SCL 0724.50 , "Customer Requirements for Padmount Transformer Services, Looped Radial System"

Note: Dimensions of the transformer vault or pad are determined by City Light and are contingent on:

- *The capacity of transformer(s) to be installed. Transformer size is determined by the customer's total electrical load and aggregate service entrance capacity.*
- *The type of devices used for secondary connection to the customer's NEC-sized service entrance equipment.*
- *The working clearance needed around the equipment.*

All vault and pad-mounted transformers must be located to provide safe access and code clearances from fire escapes, combustible materials, and other hazards. Building owners must make provisions to prevent unwanted debris from accumulating in and around vaults and pads.

The customer must contact City Light well in advance of building design to receive the necessary requirements. These specifications will be provided by City Light in the Service Construction Letter after reviewing the customer's plans.

3.7.1. Water Entry Prevention

The customer is responsible for the following measures to avoid water entry into buildings and service equipment:

- System design that considers elevation differences and other factors that would cause a problem. The design should prevent water from entering the building or electrical equipment to prevent electrical hazard or property damage. A City Light Representative can advise the customer in this concern.
- Watertight grouting of conduit where it enters the building, the vault, or the handhole.
- Watertight conduit sealing for customer/contractor installed conductors to prevent water from entering the service conduits.

3.7.2. Vault Access

The customer must provide properly supported, unobstructed access from the right-of-way to the vault for City Light equipment handling machinery to deliver all necessary equipment. In-building vaults must not be located more than one floor below the building's exterior finished grade and must have elevator access.

For all properties with an in-building vault, and for properties where below grade vaults and transformer pads are located such that the customer cannot meet the requirements spelled out above, a City Light Equipment Transportation Agreement (ETA) must be signed by the property owner.

An ETA is a legal document in which the building owner(s) take sole responsibility for moving the transformer(s) into and out of the vault, to a mutually agreed-upon location from which City Light is able to deliver or pick up the transformer(s) using our normal transportation methods and equipment.

All ETAs will be recorded on the property title at the property owner's expense, as all future owners are obligated to the same terms and conditions of the agreement. Any damage occurring to the transformer during transportation by the building owner(s) and any additional expense incurred because of said damage must be paid by the building owner(s).

A copy of the ETA must be kept in the vault, permanently installed in a document enclosure on the vault wall beneath the light switch. The customer must provide and install a weatherproof enclosure large enough to hold a paper copy of the ETA.

For vault construction requirements, see:

[City Light Construction Standard 0751.00](#), Construction Requirement, In-Building Transformer Vaults, Network and Looped Radial Systems

[City Light Construction Standard 0751.60](#), Concurrent Customer Requirements, In-Building Transformer Vaults

3.8. Fire Clearance

All vault and pad-mounted transformers must be located to provide safe access and code clearances from fire escapes, combustible materials, and other hazards. This is necessary to comply with the fire clearance requirements of City Light and the appropriate City, County, or State inspecting authorities. Building owners must make provisions to prevent unwanted debris from accumulating in and around vaults and pads.

The customer must contact City Light well in advance of building design to receive the necessary requirements. These specifications will be provided by City Light in the Service Construction Letter after reviewing the customer's plans.

3.9. Vibration and Noise Levels

The customer is responsible for isolating the transformer vault or pad so that sound and vibration levels satisfy the applicable laws and ordinances of the Washington Administrative Code (WAC), the City of Seattle, or other applicable jurisdictions, including the customer's own requirements. Further, it is the customer's responsibility to mitigate any magnetic field effects from any customer-owned sensitive equipment.

3.10. Elevators

Elevator service must be provided to any building level where a transformer vault is located.

3.11. Special Services

3.11.1. Mobile Home Parks

City Light will supply one service to a mobile home park per Seattle Municipal Code 21.49.100, Paragraph H, Section 2. Installation and maintenance beyond the service connection point will be the owner's responsibility. Meter locations must be accessible, and meters grouped. See Chapter 6, Metering, for more information.

3.11.2. Mobile Homes on Individual Owner Lots (not part of a mobile home community)

Mobile home installations that are not part of a mobile home community will require a service pole and meter socket that is not attached to the mobile home, per NEC requirements.

3.11.3. Houseboat Piers

City Light service houseboats must be terminated on shore. The termination equipment must also be approved by City Light.

City Light will not upgrade existing overhead distribution on houseboat piers. If additional loads require upgrading of houseboat pier electrical distribution, it is the customer's responsibility to do so.

3.11.4. Boat Moorages

New or upgraded service to boat mooring establishments must be master metered per Seattle Municipal Code 21.49.100, Paragraph H, Section 1. See Chapter 6, Metering for more information.

3.11.5. Unit Lot Subdivisions

For unit lot subdivisions, the parent parcel is considered one development site. Service entrance conductors must be combined in such a way that all structures on the parent parcel can be served from one service drop or service lateral directly from the City Light distribution system. The design of the distribution system to serve the site shall be within the sole discretion of City Light. No bridled services will be allowed.

4. Network Services

4.1. Introduction

Network service areas are designed to provide redundancy and continuity of service in the case of outages and include protective devices to prevent backfeed onto the grid. Because of this, there are special rules for customer generation. Please see Chapter 5, "Customer Generation" for more information.

City Light has four network service areas: Downtown, First Hill, University District, and the South Lake Union Area.

Secondary services in network areas are served from street networks, where the transformers and related equipment are located in facilities in the right of way. Primary services are served from spot networks, where the facilities are located on the property of the service.

This chapter includes general guidelines for service installations in network areas. Customers must contact City Light well in advance of the project starting to receive the required design specifications.

4.2. Single Service Rule

This rule states that City Light will provide only one service to a site or building. Additional services will be supplied only at City Light's option and will be agreed to in writing. If City Light needs to add equipment to the distribution system to provide a second service, the customer will be billed the full cost of that addition, including the equipment.

4.3. Clearances

All projects must meet the requirements for clearances from utility equipment. See Section 1.10.

4.4. Permitting and Inspections

See Section 1.7.

4.5. Service Notes, General

All services in the Network system are underground.

Single-phase, three-wire and three-phase, four-wire service can be provided. Three-phase, three-wire service is not available at any voltages.

The service rating must be determined by the nameplate ampere rating of the main service disconnect. In the absence of a single main service disconnect, City Light will determine the service rating by the nameplate rating of the main service bus or the rating of the main busing in the service entrance panel, whichever applies.

In buildings where multiple services are connected from one service drop or service lateral, the service rating for the building must be the aggregate of the individual service ratings.

Table 4.5 shows the available service voltages and corresponding maximum service entrance ratings for secondary service in Network Areas.

TABLE 4.5. AVAILABLE SERVICE VOLTAGES AND MAXIMUM SECONDARY SERVICE ENTRANCE RATINGS FOR NETWORK AREAS	
Single-Phase Service Voltage (V)	Maximum Secondary Service Rating (A)
120/208	200
277/480	100
Three-Phase Service Voltage (V)	
120/208Y	1000
277/480Y	600

^a The maximum allowable service ampacities indicated in the table represent the total single-phase and three-phase loads combined. The customer will be required to connect all single-phase loads across the grounded phase, unless otherwise agreed to by City Light.

Services to larger buildings, commercial office buildings and apartment buildings may have large electrical services where the aggregate service entrance capacity exceeds that allowed maximum secondary service size listed in Table 4.5. For these services, the customer must provide a vault on private property for City Light transformer(s) and associated service equipment. Such a vault for City Light transformer(s) must be located on the site being serviced, or in an easement area on private property.

4.6. Vault Construction

For vault construction requirements, see:

[City Light Construction Standard 0751.00](#), Construction Requirement, In-Building Transformer Vaults, Network and Looped Radial Systems

[City Light Construction Standard 0751.60](#), Concurrent Customer Requirements, In-Building Transformer Vaults

Dimensions of the transformer vault are determined by City Light and are contingent on:

- The capacity of transformer(s) to be installed. Transformer size is determined by the customer's total electrical load and aggregate service entrance capacity.
- The type of devices used for secondary connection to the customer's NEC-sized service entrance equipment.
- The working clearance needed around the equipment.

4.7. Water Entry Prevention

The customer is responsible for the following measures to avoid water entry into buildings and service equipment:

- System design that considers elevation differences and other factors that would cause a problem. The design should prevent water from entering the building or electrical equipment to prevent electrical hazard or property damage. A City Light Representative can advise the customer in this concern.
- Watertight grouting of conduit where it enters the building, the vault, or the handhole.
- Watertight conduit sealing for customer/contractor installed conductors to prevent water from entering the service conduits. The vault interior must remain dry. The customer must prevent water from entering the vault

4.8. Vault Access

The customer must provide properly supported, unobstructed access from the right-of-way to the vault for City Light equipment handling machinery to deliver all necessary equipment. In-building vaults must not be located more than one floor below the building's exterior finished grade and must have elevator access.

For all properties with an in-building vault, and for properties where below grade vaults and transformer pads are located such that the customer cannot meet the requirements spelled out above, a City Light Equipment Transportation Agreement (ETA) must be signed by the property owner.

An ETA is a legal document in which the building owner(s) take sole responsibility for moving the transformer(s) into and out of the vault, to a mutually agreed-upon location from which City Light is able to deliver or pick up the transformer(s) using our normal transportation methods and equipment.

All ETAs will be recorded on the property title at the property owner's expense, as all future owners are obligated to the same terms and conditions of the agreement. Any damage occurring to the transformer during transportation by the building owner(s) and any additional expense incurred because of said damage must be paid by the building owner(s).

A copy of the ETA must be kept in the vault. The customer must provide and install a weatherproof enclosure large enough to hold a paper copy of the ETA. The ETA must be permanently installed in a document enclosure on the vault wall beneath the light switch.

4.9. Fire Clearance

All vault and pad mounted transformers must be located to provide safe access and code clearances from fire escapes, combustible materials, and other hazards. This is necessary to comply with the fire clearance requirements of City Light and the appropriate City, County, or State inspecting authorities. Building owners must make provisions to prevent unwanted debris from accumulating in and around vaults and pads.

The customer must contact City Light well in advance of building design to receive the necessary requirements. These specifications will be provided by City Light in the Service Construction Letter after reviewing the customer's plans.

4.10. Vibration and Noise Levels

The customer is responsible for isolating the transformer vault or pad so that sound and vibration levels satisfy the applicable laws and ordinances of the Washington Administrative Code (WAC), the City of Seattle, or other applicable jurisdictions, including the customer's own requirements. Further, it is the customer's responsibility to mitigate any magnetic field effects from any customer-owned sensitive equipment.

4.11. Elevators

Elevator service must be provided to any building level where a transformer vault is located.

4.12. NEC-Sized Service Entrances in Network Areas

The maximum size of an NEC cable allowed to enter a vault is 750 kcmil.

Depending on transformer size, City Light may terminate a maximum of six (6) sets of NEC-sized cables directly on the transformer secondary terminals.

4.13. Secondary Service

The aggregate service ampacity must be limited to 1000 A at 120/208Y, or 600 A at 277/480Y, depending on which is available.

Where the service entrance ampacity exceeds 200 A at 120/208Y or 100 A at 277/480Y, the service must be three-phase, four-wire, and the load must be balanced.

The customer must install the necessary conduit to the City Light-designated point of termination. City Light will extend this conduit to the City Light service handhole or vault and install service conductors to the point of service connection designated by City Light.

TABLE 4.13. REQUIREMENTS FOR RESIDENTIAL AND MULTI-FAMILY SERVICE IN NETWORK AREAS

Single-Phase Service Voltage (V)	Requirement(s)
120/208 up to 200 A	The customer must install service conduit to a City Light-designated point on the property line.
277/480Y up to 100 A	The customer must install service conduit to a City Light-designated point on the property line.
Three-Phase Service Voltage (V)	
120/208Y greater than 1000 A	The customer must supply a transformer vault or space on the premises for our transformer(s), as well as service conduits to the property line as specified by City Light. The transformer vault must be approved by City Light and must be in compliance with City Light electrical and building codes.).
277/480Y greater than 600 A	The customer must supply a transformer vault or space on the premises for our transformer(s), as well as service conduits to the property line as specified by City Light. The transformer vault must be approved by City Light and must be in compliance with City Light electrical and building codes.).

4.14. Primary Service

Contractors must notify City Light well in advance of designing their buildings, as the requirements for primary service may alter the building design. For example, City Light may require space not only for the vault, but for a primary switchgear room as well.

Where the aggregate service entrance capacity exceeds 1000 A at 120/208Y or 600 A at 277/480Y, the customer must provide a vault or other suitable facilities on private property for the City Light transformer(s) and associated service equipment. Such vault or other facility for Utility transformer(s) must be located on the site being served.

Services greater than 600 A at 277/480Y will be required to be spot networks. They cannot be served from the adjacent street network.

4.15. Fault Current Limiters

When the customer installs fault current limiters on the line side (the City Light side) of the first disconnect or main breaker, the customer must install a current limiter enclosure that meets the requirements below:

The enclosure must be sealable and separate from our service termination point. The customer's weatherhead, service terminal box, meter socket, and current transformer enclosures are not acceptable locations for current limiters.

The current limiter enclosure must be clearly marked "Fault Current Limiters," and it may not be used for any other purpose, such as a connection point for taps or extensions.

The customer is responsible for maintaining and replacing fault current limiters. If repair or maintenance operations require City Light to temporarily disconnect the service, the customer will be billed for this labor. After any maintenance operation, the customer must notify City Light for replacement of meter seals.

5. Customer Generation

Customer generation refers to customers' ability to generate power from sources interconnected with the City Light distribution system through their service connection. Capacity is measured in Alternating Current (AC).

5.1. Net Metering

City Light will allow net metering up to 100 kW of generating capacity from the following sources: water, wind, solar energy, or biogas from animal waste as a fuel.

Installations above 100 kW of generating capacity will be considered a power purchase and will be subject to a separate rate class.

Net metering is prohibited in network areas, but customers are allowed to generate to offset consumption. See the "Customer Generation within the City Light Network Service Areas" section below for more information.

All installations must be inverter based. If a non-inverter based generating source is proposed, it will be subject to review by City Light Engineering and will be subject to standard engineering charges.

If net metering is being installed on an existing service, the location of the interconnection meter socket must meet all current requirements for access and placement as defined in Chapter 6, Metering.

Exception: If the net meter socket is located on a houseboat or floating home, the net meter must be moved to the dock adjacent to the structure.

Engineering review is required for the following installations:

- Any system over 10 kW, residential or commercial
- Any battery back-up system of any size, residential or commercial
- All network area systems of any size, residential or commercial

A lockable disconnect switch that is readily accessible to utility personnel is required for any system with a generating capacity greater than 25 kW. The location of disconnect switch must be approved by City Light prior to equipment installation.

Exception: Network area systems have special disconnect requirements. See Section 5.2.

Any alterations to the City Light distribution system that are required to accommodate customer generation will be at the installer's expense.

All customers who interconnect with the City Light distribution system must submit a signed interconnection application and agreement to City Light prior to commencing generation. The customer will also submit an electrical diagram and riser diagram showing the construction of the generation system, proposed metering locations and how the system interconnects to the building's electrical system.

Line side taps are not allowed in meter sockets.

5.2. Customer Generation Within the City Light Network Service Areas

All network installations will be subject to approval by City Light Engineering and must meet all requirements listed in Chapter 4.

To determine if a location is within a network service area, please see our network maps on the Seattle City Light website at <http://www.seattle.gov/light/electricservice/map.asp>. Consult with City Light Customer Engineering to determine if the generating facility is located in a spot or grid network within the network area.

For interconnection of a Distributed Energy Resource within a Spot Network or Area Network, compliance with IEEE Std 1547.6 is required. As such, customers may generate to offset load but back feed that would adversely affect network protector operations is not allowed. To prevent back feed, the aggregate generating capacity of the Distributed Energy Resource may not exceed 20% of the Network's anticipated minimum load. If solar energy Distributed Energy Resource are used exclusively, only the anticipated daytime minimum load must be considered. City Light may select any of the following methods to determine anticipated minimum load:

- The Network's measured minimum load in the previous year, if available
- Five percent of the Network's maximum load of the previous year
- The applicant's good faith estimate, if provided
- The Utility's good faith estimate if provided in writing to the Applicant along with the reasons why the Utility considered the other methods to estimate minimum load to be inadequate.

In addition, the Distributed Energy Resource may be required to use a minimum import relay and/or other protective scheme as required by City Light. This equipment will be installed at the customer expense. At City Light's discretion, the requirement for minimum import relays or other protective schemes may be waived.

A system disconnect that is readily accessible to utility personnel with twenty-four (24) hour access as defined in Seattle Municipal Code: Chapter 21.49.110, Section N is required for all systems. Location of said disconnect must be approved by the utility prior to equipment installation. The disconnect must have a visible break and must have provision to lock in the open position only.

The customer will provide permanent phenolic signage and a map, at the utility's direction, to be placed in the Network Vault of the generating property. Signage will state the generation capacity; location of generation equipment; location of system disconnects and location of interconnected billing meter.

5.3. Production Metering

Where production meters are required, meter installations will be subject to the standard installation rate for billing meters of the same voltage and phasing. All production meters must meet City Light and City of Seattle requirements for height, clearance, signage and accessibility, as defined in Chapter 6, Metering.

Systems incorporating battery back-up will be subject to engineering review and may require more than one production meter, or meters with special configurations.

Production meters are not allowed to be current transformer meters unless the generating ampacity exceeds 225 A.

TABLE 5.3. PRODUCTION METER LOCATION GUIDELINES	
Service Type	Guidelines
Single-family homes, duplexes, triplexes, and parcels with Accessory Dwelling Units (ADUs)	The production meter is to be co-located with the net meter. Variances may be granted at the discretion of a City Light Representative, in consultation with Technical Metering.
Houseboats and floating homes: On the floating structure On the dock On shore	The net meter must be relocated to a meter pedestal on the dock, and the production meter co-located with the net meter. The production meter may be co-located with the net meter. The production meter may be located on a meter pedestal on the dock adjacent to the floating structure."
Townhomes	If the net meter for the array is located at the unit that the array is on, the production meter should be co-located. If there is a meter pack for all of the units at the point of termination, then the production meter may be located at the unit where the array is located.
Multi-family buildings	The production meter can be located in the closest approved meter room to the array, even if the net meter is located on a different floor.
Commercial structures	Production meter locations need to be approved by a City Light Representative prior to installation.

The customer will provide permanently affixed phenolic signage at the production and net meter sockets, indicating their function. (i.e.net or production).

For all installations where the net meter and production meter are not co-located, the customer will provide additional permanently affixed phenolic signage that states the location of the corresponding meter.

6. Metering

6.1. Introduction

Electricity meters are required for all electrical services so City Light can accurately determine customer usage for accurate billing and for maintaining appropriate distribution to our customers.

City Light provides and installs all electricity meters for customer-installed meter sockets. This chapter describes the requirements for equipment, location, and clearances for both simple and complex meter installations.

City Light installs and maintains meters, instruments, transformers and associated equipment that are located on the City Light side of the meter. City Light has ownership of this equipment. Customer-owned, installed, and maintained equipment includes meter sockets, enclosures, landing pads, lugs, conduit, and conductors.

City Light must determine the specific metering equipment requirements after reviewing customer plans and / or drawings.

Drawings must be submitted and approved for customer-designed pedestals or other structures on which the customer is proposing to mount metering or service entrance equipment. All drawings or prints submitted to City Light must be engineering or architectural grade.

6.2. Requirements, General

6.2.1. Service Entrance Conductors for Metered Loads

Unmetered service conductors and metered load conductors must not be run in the same conduit, raceway, or wiring gutter.

Metering equipment and enclosures containing unmetered service conductors, wire troughs, and busing must be sealable and lockable as determined by City Light.

Metered load conductors must not pass through sealable sections, including current transformer enclosures.

Service conductors must be continuous from the service connection point to the meter socket or current transformer enclosure, or in a main disconnect for group installations. Conductors must not pass through any junction box or "T" condulets, etc. This does not prohibit the use of buses or wire troughs on the line side of multi-meter installations if the enclosures are locked and sealed.

6.2.2. Conductor Connections

For aluminum conductors and connections, an oxide inhibitor must be used. The meter socket must have lugs approved for aluminum.

When copper is used as conductor, meter terminals, and/or socket jaws, an oxide inhibitor must not be used.

6.3. Voltages

All services must be metered at the service voltage.

Exception: 277/480Y three-phase services transformed to 120/208 or 120/240 for distribution in multi-unit buildings is allowed.

All high voltage services, 601 V and above, must be metered at the service voltage in accordance with the Electric Utility Service Equipment Requirements (EUSERC) standards and City Light Construction Standards. For voltages greater than 600 V, contact your City Light Representative for high voltage metering requirements.

6.4. Meter Sockets

All services must be metered in accordance with the Electrical Utility Service Equipment Requirements Committee (EUSERC) Standards. Contact your City Light Representative for questions regarding EUSERC standards.

While City Light provides and installs the meter, the customer is responsible for providing and installing the meter socket and current transformer equipment, if applicable. All meter sockets must meet ANSI C12 and UL 414 Standards for Meter Sockets. All current transformer enclosures (CT cans) and metering switchgear must meet EUSERC and City Light standards.

It is important to refer to [City Light Construction Standard 1553.03](#), Meter Base and Socket Configurations, for the correct meter socket for your application in order to avoid delays to receiving service.

City Light does not allow ringless meter sockets/bases of any type.

Commercial services require either a block by-pass or a safety socket.

Block bypass sockets must be used on 400 A (class 320) underground service, whether residential or commercial.

200 A residential services do not require block bypass sockets; however, they are strongly recommended.

Safety sockets are required where the service voltage is 277 V to neutral or 480 V phase to phase.

City Light does not allow automatic, lever type, or slide-link socket bypass devices.

Only metering taps are allowed in meter sockets. Examples of metering taps are the 5th and 7th terminal connections to the neutral and a 5th terminal connection to the unmetered leg as in existing three-phase, three-wire Delta services.

5th terminals must not be installed in 120/240 V sockets.

Customer must shim meter sockets and fasten with screws.

Flush-mounted meter sockets will be encased in concrete or require cover inspection.

The line side conductors are connected to the top terminals of the meter socket. The load side conductors are connected to the bottom terminals.

Exception: Production meter sockets must be wired with the line side conductors connected to the bottom terminals, and the conductors from the generation source on the top terminals.

Unused threaded or knockout openings must be closed with an approved plug locked in place from the inside. Metering equipment enclosures must be weatherproof if they are located outside.

Meter rings will be provided by City Light.

When aluminum conductors and connections are used, the meter socket must have lugs approved for aluminum.

6.5. Location, Access, and Protection of Metering Equipment

6.5.1. Location

Single meter sockets must be installed in an accessible location outside the building. Multiple socket installations may be located inside the building.

The area around and access to all City Light equipment must be free from vegetation.

Metering equipment must not be installed over stairs, stairwells, steps, or public walkways. If mounted on a balcony or platform, a fixed stairway to the area is required and must be maintained for the duration that the service exists. Ship's ladders are not allowed. For balcony or platform installations the structure must be professionally engineered. The structure must meet all Washington Administrative Code (WAC) requirements. City Light requires meshing be installed on the railing as an additional safe guard with the opening not to exceed 1/2 inch.

City Light may post a Utility logo on the outside of meter room doors. City Light must inspect and approve the customer's choice of location for meter sockets and metering equipment prior to beginning equipment installation. The location must be readily accessible without risk of bodily harm to City Light employees and free from vibration, corrosive atmosphere, and extreme temperatures.

Inside meter locations must have sufficient lighting to read meters and maintain equipment.

Meter rooms must be for the sole purpose of electrical switchgear and metering equipment. Under no circumstances will gasoline, diesel fuel, propane, paints, or any other noxious or hazardous materials be stored in a meter room.

Meter locations must not be under or over any structure which might be enclosed or removed in the future, such as a porch, deck, carport, or stairway.

All current transformer enclosures will be installed in an accessible location outside the building or in an approved electric meter room. For residential services the current transformer enclosures must be outdoors and accessible during normal Utility working hours.

Electric meter sockets must be installed a minimum of 3 ft from the closest point of a natural gas meter installation. The natural gas meter installation must not be within the required working space as specified in Section 6.5.2.

6.5.2. Access to Metering Equipment

City Light reserves the right to access the customer's premises during normal business hours (Monday through Friday, 8 AM to 4 PM) for meter reading, testing, installation, removal, inspection, and/or maintenance of City Light equipment.

Access must not be blocked by either permanent or portable materials.

Any fenced/enclosed areas and/or metering cabinets/enclosures must be made accessible with a City Light-provided key box at the owner's expense. This lock box will be co-located with the Fire Department's Lock Box (where applicable). The customer must provide keys and/or key cards.

All metering equipment covers must be readily accessible. They may not be plastered, caulked, or built in, in any way, so as to impede the opening of the meter cover or metering equipment covers including current transformer enclosure covers or doors.

All metering equipment doors must open a minimum of 90 degrees from the front of the enclosures. Outdoor equipment enclosure doors must have a hold open device.

The width of the working space must permit access to the metering equipment and in no case will be less than 36 inches. The working space must extend at least 36 inches out from the face of the meter. A level working space no less than 36 in by 36 in must be provided and maintained in front of all meter equipment with no obstructive vegetation.

6.5.3. Protection

Where damage of metering equipment has or is likely to occur from vandalism, vehicles or other causes, City Light may require the customer to install protective devices such as bollards, barriers, or enclosures at the customer's expense.

Metering equipment enclosures installed in outside locations must be weatherproof.

Pedestal metering equipment must be sturdy enough for reasonable installation or removal of a meter without damage to the pedestal.

Indoor spaces housing metering equipment must have the ambient air temperature maintained below 30 degrees C (86°F). The customer is responsible for cost of maintenance, repairs and replacement of meter equipment resulting from ambient temperature.

6.6. Meter Height and Clearances

6.6.1. Meter Height

The meter height is measured from grade or the floor to the center of the meter.

The preferred meter height for single meter sockets is 5 ft.

All meter sockets must be mounted plumb and be securely fastened.

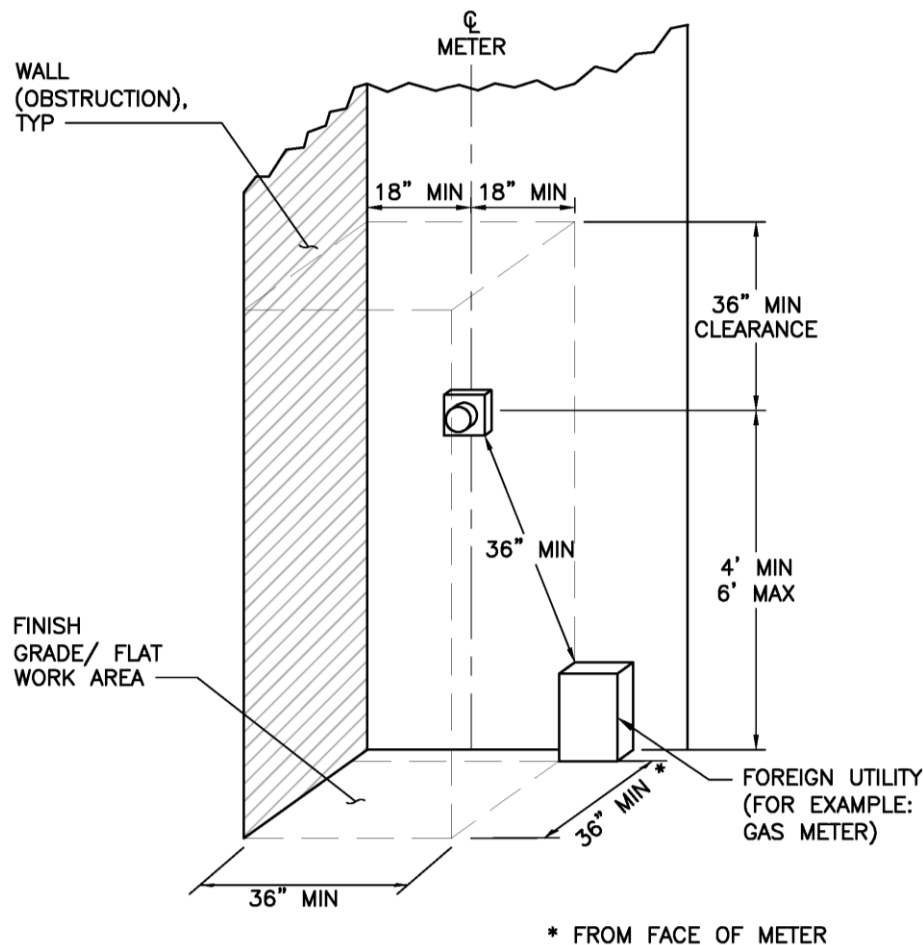
TABLE 6.6.1. METER HEIGHT REQUIREMENTS		
Type of Installation	Height, Minimum (ft)	Height, Maximum (ft)
Single-Meter Socket	4	6
Multi-Unit Installations	2	6

6.6.2. Clearances

The following minimum clearances must be maintained:

- Between the electric meter and grade: 4–6 ft, 5 ft preferred
- Between either side of the electric meter and any walls or protrusions: 18 inches
- Above the center of the electric meter: 36 inches minimum
- Between any meter socket and a gas meter: 36 inches

Figure 6.6.2. Meter Clearances



6.7. Service Entrance Equipment Sequencing

Single Meters Self Contained:

- The sequence of service equipment with self-contained metering must first be meter socket and next the fused disconnect/circuit breaker. A switch cannot precede the meter except in certain multi-unit installations (described below).
- Pedestal metering must not contain the customer's main disconnect.

Multi-Unit Installations

- A main disconnect may be installed ahead of the meters in multi-unit installations involving more than six individual sockets provided that all equipment ahead of the meters has sealing provisions.
- In multiple meter socket installations, which have a switch or breaker ahead of the meters, the breaker must be the common trip type, i.e., must open or close all ungrounded conductors simultaneously. The breaker must be constructed to prevent being changed to a non-trip type.

6.8. Special Metering Requirements for Multi-Unit Buildings

The number of meter centers in apartment buildings shall not exceed one for every three floors.

Prior to meter installation all meter sockets must be identified with permanent labeling by final space or unit number, letter designation, and/or street address. Meter sockets must have engraved phenolic nameplates installed on the cover of the meter socket.

Note: Felt-tip pens and label-maker tape are not considered permanent marking.

Permanent numbering of the separately metered spaces or units is required. If it is not practical before meter installation, the customer must provide temporary identification at the main entrance of the space for the purpose of performing space checks.

Please see the appendix document, "Contractor's Pre-Installation Checklist Multi-Unit Metering," for more information.

All multi-unit buildings must have at least one meter for each unit. Where common load exists, an additional house meter is required.

City Light-conducted space checks are required for all new and rewired multi-unit buildings to verify socket-to-unit panel wiring.

All auxiliary dwelling units without separate metering, and/or units found to have mixed or common loads will be billed in the owner's name.

After the initial service installation, all additional space checks, address changes, and mixed- load checks will be charged to the owner or person making the request.

Load determination will be based upon the greatest aggregate nameplate ratings of each fused disconnect or circuit breaker.

The following minimum clearances for meter rooms must be maintained:

- Vertical clearance between socket centers: 9 inches
- Horizontal clearance between socket centers: 8 inches
- Between either side of the meter pack enclosure and a wall: 18 inches
- Between the bottom of the meter enclosure and grade: 2 ft
- Between closest edge of a gas meter regulator and the closest edge of the meter pack enclosure: 3 ft
- Height of meter pack: 6 ft
- From grade to ceiling: 7 ft–1 in
- Working space: 3 ft square in front of meter pack from grade to top edge of meter pack

Diagram illustrating the minimum clearances for a gas meter installation:

- WALL (OBSTRUCTION), TYP.
- FINISH GRADE/ FLAT WORK AREA
- 36" MIN
- 18" MIN
- 9" MIN
- 8" MIN
- 36" MIN
- 6'-0" MAX
- 2'-0"
- 36" MIN *
- FOREIGN UTILITY (FOR EXAMPLE: GAS METER)
- * FROM FACE OF METER

6.9.1. Current Transformer-Rated Metering

Exceptions: (1) residential services with 400 A services that use class 320 metering, and (2) remote metering with services under 225 A.

Figure 6.9.1. CT Service, Typical



All transformer-rated meter sockets must have test switch provisions.

6.9.2. Landing Pads and Enclosures

Current transformer enclosures must contain only service conductors, metering equipment, and meter conductors. They must not be used as a junction box, gutter, or raceway for the purpose of making taps.

Exception: Taps must be allowed on the load side of the customer's landing pads to accommodate emergency services, fire pumps, and/or elevator ventilation systems as allowed by local/national fire codes.

All services rated at 800 A or less that use current transformer landing pads having mechanical lug provisions for termination of line and load conductors. Landing pads must be centrally mounted in the current transformer enclosure and the conductors will enter and leave near the corners.

Note: If terminations cannot be made in accordance with manufacturer requirements and/or equipment listing, a bus gutter will be required to accommodate additional taps.

All services rated over 800 A must be installed in manufactured metering switchgear per EUSERC specifications.

The minimum size of current transformer enclosures must be as follows:

- Single-phase 400 A or under: 24 inches wide x 48 inches high x 11 inches deep.
- Single-phase over 400 A: 36 inches wide x 48 inches high x 11 inches deep.
- Three-phase: 36 inches wide x 48 inches high x 11 inches deep.

Note: Larger current transformer enclosures may be necessary depending on the National Electric Code (NEC) requirements for conductor bends.

All landing pads must be of heavy-duty type with minimum (AIC) fault duty rating of 50,000 A rms symmetrical. They must be UL labeled and built to EUSERC standards.

The cover of the current transformer enclosure or switchgear must be side-hinged and have provisions for locks and seals. Hinges must be built so that they cannot be disassembled from the outside of the enclosure. All metering equipment doors must open a minimum of 90° from the front of the enclosures.

The top of the current transformer enclosure must not be higher than 7 ft and the bottom must not be lower than 6 inches from the finished grade or floor.

Connection to the grounded service conductor (neutral) must not be used to bond current transformer enclosures. Bonding must be derived from the service main grounding point.

6.9.3. Secondary Wiring

The customer must provide a 1-inch minimum conduit between the current transformer enclosure and the meter socket. A maximum of 360 degrees of bends is allowable. For metering runs over 75 ft, a 1-1/4-inch minimum conduit is required.

Junction boxes and condulets are not allowed in conduit runs for secondary metering conductors.

The customer must provide metering secondary conductors, leaving 8 ft of wire in the current transformer enclosure and 2 ft of wire in the socket enclosure.

Exception: City Light will provide the metering secondary conductors when the socket is within 10 ft of the current transformer enclosure.

All secondary conduit runs over 75 ft must have prior approval by the City Light Technical Metering Unit. Conduit runs beyond 250 ft are not permitted.

The conductor colors for CT metering secondary runs are as follows:

- Single-phase: 1 black, 1 red, #12 solid conductor (voltage)
- 1 black, 1 red and 1 white #10 solid conductor (current)
- 1 green #12 solid conductor (bonding)
- Three-phase: 1 black, 1 red, 1 blue, 1 white, #12 solid conductor (voltage)
- 1 black, 1 red, 1 blue, 1 white #10 solid conductor (current)
- 1 green #12 solid conductor (bonding)

For secondary runs over 75 ft the current conductors need to be sized as follows:

- #8 stranded conductors for current circuits from 75 ft to 150 ft.
- #6 stranded conductors for current circuits from 150 ft to 250 ft.

6.10. Switchgear

6.10.1. General

City Light's Technical Metering Unit will provide the customer with specific information on metering requirements for individual projects after they have reviewed plans submitted by the customer. Prints or drawings of the metering equipment must be submitted and approved by City Light prior to manufacture when the equipment is to be installed in switchgear. The drawings need to show the sequence of compartments, dimensions of the gear and manufacturer information.

6.10.2. Switchgear Operating at Voltages Up to and Including 480V

Multiple self-contained metering: the clear space around each meter socket will not be less than one inch at the top and the sides, and not less than 2 inches at the bottom.

All side clearances will meet City Light standards.

Metering section panels on switchgear will open a full 90° to the switchgear.

The termination cabinet, current transformer cabinet and any other switchgear section exclusively under City Light's control must not contain any customer equipment that requires servicing, control wiring or load monitoring equipment. These sections must contain only service entrance conductors/bus and City Light metering equipment. must not be installed in current transformer metering compartments. For further information contact your City Light Representative.

Permanent switchboard metered services must not have the electric meter located on the switchboard door adjacent to the current transformer compartment. The meter must be located in a remote single meter socket with a test switch provision on the nearest possible wall.

Note: Permanent engraved phenolic unit or equipment designation labeling is required at both the meter socket and the switchboard.

6.10.3. Switchgear Operating at Voltages Greater Than 480 V

Contact your City Light Representative for requirements and construction guidelines.

6.11. Master Metering

City Light must not supply electricity for any new service to a duplex or multiple dwelling building for the purpose of master metering the energy usage of the dwelling units, a central space heating system, or a central domestic water heating system, per [SMC 21.49.100](#). City Light will not supply electricity for any upgraded service to an existing duplex or multi-unit building for the purpose of master metering new central or individual space heating systems.

An owner-occupied dwelling unit also containing an additional “accessory housing unit” meeting all provisions as defined in [SMC 23.44](#) and approved by the City of Seattle shall be allowed to master meter.

Master metering is required for boat moorages but prohibited for houseboats.

6.12. Advanced Metering Infrastructure (AMI) for Meter Rooms

Where meter rooms are vertically stacked, a 2-inch Schedule 40 PVC conduit pathway connecting all of the meter rooms must be provided for the Advanced Metering antenna cable. Lateral meter rooms should also be tied into the vertical distribution stack whenever possible.

The conduit must have a maximum of 360 degrees in total bends.

A 1/8-inch minimum nylon zip tie pull string is to be provided in the conduit.

All connection cables for Advanced Meters must be provided by City Light and installed by the customer. City Light will make all connections.

Cables must be in contiguous runs, without splices, unless otherwise approved by City Light.

In either the top most or bottom most meter room (including sub-grade meter rooms), provide a 2-inch Schedule 40 PVC conduit to a NEMA 3R enclosure (enclosure must be at least 8 in x 8 in x 6 in) mounted on exterior of the building. The conduit must have a maximum of 360 degrees in total bends and no more than 100 ft of total length.

A 1/8-inch minimum nylon zip tie pull string is to be provided in the conduit.

All connection cables for Advanced Meters must be provided by City Light and installed by the customer. City Light will make all connections.

NEMA 3R enclosure must be mounted in a location that is approved by City Light and is safe to access. NEMA 3R enclosure must be mounted between 14 and 20 ft above ground level, unless roof top access is available and can be accessed without hazard/restraint.

Cables must be in contiguous runs, without splices, unless otherwise approved by City Light.

In the meter room with conduit to the exterior of building, the customer must provide a 2 ft by 2 ft by 3/4-inch plywood mounting board with dedicated duplex receptacle:

- Plywood must be mounted on wall adjacent to meter (or meter bank) less than 20 lineal ft from closest meter.
- The bottom edge of the plywood mounting board must be between 4 and 6 ft above floor level.
- A dedicated 120 V, 15 A duplex power receptacle must be located below the plywood mounting board.

6.13. Communications Provisions for Large Metered Loads

New or enlarged commercial/industrial services served by a single meter with loads that are expected to reach 1 megawatt or more, or that will be totalized, are required to have a phone line or communication line that meets City Light requirements at the point of metering. The customer shall own, install, and maintain the phone/communication line.

Totalizing is permitted per [Seattle Municipal Code 21.49.010](#). For more information, contact the City Light Electric Service Engineer Office at (206) 233-5164.

Where totalized metering is permitted, the customer shall install the totalizing circuitry. Meter totalizing shall meet the Utility's criteria and be approved by City Light before metering equipment will be installed.

6.14. Temporary Totalized Metering

At City Light's discretion, Temporary Totalized Metering may be utilized to capture a customer's total consumption for billing purposes. This temporary metering will generally apply to a project during initial construction but may be used when a customer is altering or upgrading their service entrance equipment.

All required equipment for this metering will be the sole responsibility of City Light, and all metered consumption will be billed in accordance with the appropriate rate schedule.

If a customer completes a Temporary Totalized Metering Agreement Form with the assistance of the appropriate City Light Representative, they will be allowed to shunt self-contained meter sockets prior to installation of the permanent metering.

Once the facility is ready for permanent meter installation, it is the responsibility of the property owner to contact City Light and ensure that all metering facilities are prepared according to City Light specifications, including the Multi-Unit Pre-metering Checklist. Failure to meet these requirements may result in fines, additional trip charges, and installation delays.

Communication Provisions for Large Metered Loads are in no way altered or impacted by the requirements of the Temporary Totalized Meter specifications.

6.15. Net Metering

City Light allows net metering on approved customer generation installations of up to 100 kW in most areas of the service territory. Installations over 25 kW, or with battery storage, will require City Light Engineering review. Net Metering is not allowed in network service areas. However, customer generation is allowed in network areas if it meets certain requirements, chief among which is that the installation be precluded from feeding back onto the network grid. For more information, see Chapter 5, Customer Generation.

7. Motors and Special Loads

7.1. Introduction

Some of City Light's large commercial or industrial customers may require motors or special loads. This chapter identifies the City Light requirements related to motors and special loads.

All motor equipment must conform to the standards of the National Electrical Manufacturers Association (NEMA).

City Light requires detailed information about new motor load installations.

At time of application for service, the customer must provide suitable protective devices on all motor installations, including protection against single phasing on polyphase motors.

7.2. Motor-Starting Limits and Interference

The customer's use of electricity must not interfere with the quality of their own service and must not interfere with the quality of service to other customers. If any motor and associated device(s) cause interference with its owner's or another customer's electrical service, the owner of the motor/device is responsible for taking corrective action at their own expense. Conforming to the requirements does not assure that interference problems will not occur.

Interference problems may arise when:

- The customer needs voltage control within unusually close tolerances
- There is an unbalance of single-phase and three-phase loads
- Where the customer intermittently switches large loads on and off, such as electric boilers, heaters, or motors

7.3. Voltage Flicker

Voltage Flicker is defined as the subjective impression of fluctuating luminance caused by voltage fluctuations. It is caused by momentary motor starting currents, switching currents, or by fault current of the distribution system.

The customer is required to adhere to City Light-established voltage flicker limits.

[See City Light Construction Standard 0041.05](#), "Voltage Flicker Limits."

7.4. Starting Limitations on Single-Phase Motors

One-half horsepower or larger motors on recurrent starting with more than one start per hour, such as those operating water pumps or furnace blowers, must be served at not less than 240 V (208 V in the Network system). Single-phase motors must not exceed the maximum locked rotor currents listed in tables 7.4a and 7.4b, unless approved in writing by City Light.

TABLE 7.4a. SINGLE-PHASE MOTOR MAXIMUM ALLOWABLE LOCKED ROTOR CURRENTS

Rated Size (hp)	At 208 V	At 240 V
5	149 A	129 A

TABLE 7.4b. SINGLE-PHASE HERMETIC REFRIGERANT MOTOR COMPRESSOR MAXIMUM ALLOWABLE LOCKED ROTOR CURRENTS (FROM NEMA STANDARDS)

Rated Size (hp)	Motor Size (hp)	208 V (Network Only)	240 V
5	5	200 A	173 A

7.5. Starting Limitations on Polyphase Motors for Secondary Services

Across-the-line starting of 15-horsepower motors or less will be permitted for starting currents less than values in Table 7.5. Reduced starting current devices must be required on all motors exceeding a 15 hp nameplate rating, or motors started more frequently than one start per hour.

Upon failure to install the required starting device, City Light will disconnect the service until it is acceptable. Reconnection must be at the customer's expense.

TABLE 7.5. POLYPHASE MOTOR MAXIMUM ALLOWABLE LOCKED ROTOR CURRENT (DERIVED FROM NEMA STANDARDS)

Rated Size (hp)	120/208Y, Three-Phase (A)	120/240, Three-Phase (A)	277/480Y, Three-Phase (A)	240/480 Open Delta (A)
15	250	125	108	63

Note: Starting devices may be omitted on smaller motors of a group installation when the omission does not result in a starting current in excess of the starting current limits shown.

7.6. Electric Power Regeneration Due to Motor Drive/Control

Regeneration of electric power while braking, or upon motoring-down, must not exceed circuit loading at the common point of termination unless the operation has been approved by City Light. Typically, regeneration is intermittent and can cause mis-operation of the distribution system which may jeopardize worker safety.

7.7. Maximum Switched Load

The maximum increment of load to be switched as a unit will be 90 kVA, three-phase or 30 kVA, single-phase. Loads in excess of these amounts may require the customer to furnish and install special switching equipment to reduce the magnitude of unit loads to be cycled on and off.

7.8. Welding Equipment

Welding equipment must conform to the standard of the National Electrical Manufacturers Association (NEMA).

7.9. Minimum Power-Factor Limitations

7.9.1. Lighting

Low power-factor lighting, such as LED, neon, mercury vapor, and fluorescent, must have suitable auxiliary equipment to provide a power factor of not less than 97% lagging at the meter location.

7.9.2. 85% Minimum Power Factor

The minimum power factor per billing cycle must be at least 97% lagging and always above 85% lagging at the meter location. Any auxiliary power factor correction equipment must be switched with the load so that at no time will it supply leading Volt Ampere Reactive (VAR) to the City Light distribution system unless there is written approval by City Light.

7.9.3. Capacitor Control

Capacitors installed by the customer for power-factor correction must be switched by automatic means so that the capacitors will be switched off during periods of reduced load.

8. Protective Devices and Back-Up Generators

Electrical equipment and the availability of electricity to a building can be affected by power surges, faults, natural and switching transients, planned and emergency power outages, natural mechanical failure and other events not within the control of City Light. Customers may avoid such problems by installing protective devices or backup generation equipment in the case of power outages. It is the customer's responsibility to take the above steps as provided by Seattle City ordinance ([SMC 21.49.110](#) (G) and (Q)).

Surge protective devices purchased and installed by the customer should provide protection from surge voltages generated within customer premises and generated by lightning, switching, and arcing on the Department's system to the full range of parameters described in "IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits, C62.41-1991," or latest revision.

City Light personnel are available to provide information regarding such problems. However, such consultations are not a substitute for professional advice from the customer's contractors and their own professional electrical engineers.

8.1. Inverter-Based Generator Systems

All inverter-based generator systems shall have batteries as their energy source.

8.2. Transfer Switches

For Network, Transfer switches must be the "open transition" type.

For Looped Radial, transfer switches may be either open or closed transition.

8.2.1. Approval

All specifications and drawings of the closed transition transfer switch must be submitted to City Light prior to construction.

The information must include one-and three-line diagrams showing all electrical equipment and protective devices. All equipment and devices must be identified by function, rating, and manufacturer's catalog number; and must include installation and operation manuals, specifications, operating features and settings.

8.2.2. Means of Disconnection

There must be a disconnect on the line side of the transfer switch. The disconnect must have a visible break and must have provisions to lock in the open position only.

City Light must have 24-hour access to the disconnect. The customer must immediately notify City Light in writing whenever the access route or operating procedures change.

8.2.3. Frequency

The frequency of the City Light system is 60 Hz nominal.

8.2.4. Waveform

The generator must deliver a sinusoidal waveform during transfer switch operation.

8.2.5. Voltage Magnitude

The voltage magnitude at the emergency supply terminal of the transfer switch must be the same as that of City Light at the service terminal point during transfer switch operation. The service voltage is determined by City Light.

8.3. Phase Sequence

The phase sequence of the voltage at the emergency supply terminal of the transfer switch must be the same as that of City Light at the service terminal point.

8.4. Phase Voltage

The phase voltage at the emergency supply terminal of the transfer switch must be in phase with that of City Light at the service terminal point during transfer switch operation.

8.5. Equipment

Generation equipment must be furnished, installed and maintained by the customer, and must be capable of withstanding and interrupting the maximum fault current specified by City Light.

The customer must provide City Light with a schedule of routine maintenance to be performed and have the maintenance record available showing that it was done.

8.6. Protective Equipment

During the time the emergency power system is connected to the City Light service terminal point via the transfer switch, protective devices are required. They will separate this emergency supply from the City Light system to protect from faults or low voltages on the system, or for faults on the customer's equipment. These devices and their settings must be approved by City Light.

City Light distribution feeders are subject to automatic reclosing. Generally, two reclosures may occur; the first within 2 seconds of the initial trip. Customers with synchronous machines are required to disconnect from the distribution system prior to the first reclosure in order to protect their equipment.

The customer is responsible for the protection of the load, the transfer switch, the emergency power system, and all associated equipment. Protection should be provided against all malfunctions or equipment failures and consideration should be given to:

- Transient surges initiated by faults, lightning, switching, or other system disturbances
- Generator overspeed or underspeed during operation of the transfer switch

8.7. Protective Relays

Protective relays must protect the City Light system from phase-to-phase and phase-to ground overcurrents on emergency power and must disconnect customer emergency systems for faults or low voltage on the City Light system.

8.8. Lockout Relays

The customer must provide one or more frequency relays for disconnecting the emergency system from the City Light system when the frequency exceeds 62 Hz for 0.5 seconds or when the frequency falls below 59 Hz for 1.0 second.

8.9. Voltage Relays

The customer must provide voltage relays to disconnect the generator when the distribution voltage (on a 120 V basis) exceeds these limits when the voltage is:

- 140 V or greater, the relay must operate within 50 milliseconds (3 cycles)
- 130 V or greater for one second, the relay must operate without intentional delay
- 90 V or less for one second, the relay must operate without intentional delay

8.10. Synchronization of Equipment

The customer must provide equipment for synchronizing the generator to the City Light system and protective relaying independent of the system.

The synchronizing device must be installed to control the closing of the generator to the City Light system.

The system parameters must all be within these tolerances before closing:

- Frequency difference less than 0.2 Hz
- Angular difference less than 5 degrees
- Voltage difference less than 5 percent

Synchronous generators may be manually synchronized within these parameters, using automatic relay supervision. Synchro-check type relays are not acceptable.

8.11. Locks on Disconnect Switches

Provisions must be made with City Light for the installation of a City Light-approved and provided padlock to lock the disconnect switch in the open position. The disconnect switch must not be lockable in the closed position.

When de-energization of an in-building transformer vault is required, City Light will open and tag the required disconnect switch and lock it in the open position.

9. Technical Requirements

9.1. Electromagnetic Interference

The building's service entrance equipment, including customer switchgear and City Light cables may produce electromagnetic fields that can affect sensitive equipment such as computer monitors. It is the customer's responsibility to design and construct the building to avoid these effects.

9.2. Power Surges, Faults, Transients, and Outages

Power surges, faults, electrical transients, planned and emergency power outages, other occurrences not within City Light's control, or mechanical failure may affect the customer's electrical equipment or electrical system, or the availability of electricity to a customer's building. Such problems may be avoided by the customer providing at customer's own expense, protective devices or backup generation equipment for power outages. It is the customer's responsibility to take the above steps as provided by City Ordinance [SMC 21.49.110](#) (G) and (Q).

10. Maintenance of Equipment and Facilities

10.1. Introduction

This chapter describes the division of responsibility between City Light and the customer for the maintenance of equipment. Table 10.1 shows distribution of responsibility by category.

TABLE 10.1. DISTRIBUTION OF RESPONSIBILITY FOR MAINTENANCE OF EQUIPMENT AND FACILITIES	
Customer	
<ul style="list-style-type: none">• All masts, brackets, conduits, and other service entrance equipment• Installation of conduit and trenching to the City Light-designated point of connection to the system• Equipment on the load side of the meter• Any other equipment for which the customer is assigned responsibility in written agreements between City Light and the customer• Vegetation to ensure a 3-ft radius of space for overhead conductors from the service pole to the weatherhead. If there is a transformer on the service pole, the customer is not responsible for any vegetation in a 4-ft area around the transformer.• Underground services, as follows:<ul style="list-style-type: none">○ Services in conduit: City Light will provide new service wire if the existing conductors fail. The City Light crew will pull out the old wire and install new service wire provided they are able to remove the old conductors. Note: If the conduit has been damaged or rusted, the wires may not be able to be removed. The customer will be responsible for replacing the conduit run.○ Services without conduit: In situations where the service wire is buried in the ground without conduit ("Direct bury") and the service fails, City Light will locate the fault, excavate, repair the cable, and backfill the excavated material. The customer is responsible for all surface restoration, e.g., grass, shrubbery, concrete.• Note: Only one repair will be attempted per service drop. If additional faults occur, the customer will be responsible for replacing the failed service with a service in conduit that meets City Light standards.	
City Light	
<ul style="list-style-type: none">• All vegetation pole-to-pole.• All City Light-installed poles and anchors.• Customer-owned poles installed by City Light – this maintenance will be at the customer's expense.• All meters, instrument transformers, and related equipment. See Chapter 6, Metering.	

10.2. Charges

There will be no charges for installing underground service conductors on existing services for replacement due to failure. Except where the conductors have faulted as a result of some action on the customer's part; e.g. wire damaged by digging; post or retaining wall installation damaging conduit and wire; improper backfill. If the cause of the fault is related to such or other actions, the customer will be charged for the repair work.

10.3. Temporary Restoration of Service

City Light may restore service on a temporary basis until the customer completes the necessary work so City Light can replace the service conductors. If City Light is unable to install an electrical meter during this time, the customer will receive an estimated bill for the period their electrical usage is unmetered.

The temporary service will be granted for a maximum of two (2) weeks.

Glossary

AMPERES: The base unit of electric current.

AMPACITY: Current-carrying capacity measured in amperes.

ASSOCIATED EQUIPMENT: In discussions of metering equipment, the term includes the meter socket, instrument enclosures, test switches, and other equipment.

AUTHORITY HAVING JURISDICTION: Refers to the local jurisdiction which permits and inspects electrical services. In the City of Seattle, this is the Department of Planning and Development (DPD).

BALANCED: When loads or phase currents on a three-phase circuit are equal.

BRIDLED SERVICE: An overhead service wire originating from one Utility pole that uses a guy wire from an adjacent pole to change the route of the service drop to the service entrance attachment point.

BUS: An electrical conductor in the form of rigid bars that serve as a common connection for 2 or more electrical circuits.

CABINET: An enclosure designed for surface or flush mounting and provided with a frame, mat or trim, and swinging doors. Cabinets are usually employed to contain panel boards.

CONDUCTOR: A material that allows electricity to move through it easily. A wire, cable, bar, rod or tube which serves as a path for electricity to flow. The most common conductor used by City Light is overhead wire.

CONDUIT: A UL-labeled wireway with a smooth interior surface that permits easy drawing in of the electrical conductors

CURRENT: The electrical current is simply a measure of how much electricity passes a given point in a fixed amount of time. It is measured in amperes.

CURRENT TRANSFORMER (CT): A transformer used in instrumentation to assist in measuring current.

CUSTOMER: Any person, firm, corporation, government agency, or other entity that uses, has used, or has contracted for electric service from City Light.

DEMAND: The amount of electricity drawn from an electrical system at a given time, measured in kW's; The amount of power required to meet the customer's load at a given instant or averaged over any designated interval of time, expressed in kilowatts or megawatts.

DIRECT BURY: The installation of electric conductors in a trench without the use of a conduit. Direct burial installations are no longer accepted by City Light.

DRIP LOOP: A downward loop in the customer's conductors, near where the customer's conductors attach to the Utility's overhead conductors, to prevent water from entering the service at the weatherhead.

EASEMENT: See Service Easement.

ELECTRIC SERVICE: All service conductors (primary and secondary), transformers, and distribution system equipment for delivering electric energy from City Light's supply system to the wiring system of the premises.

FAULT CURRENT: A current that flows between conductors or between a conductor and a ground because of an abnormal connection between the two.

GENERAL SERVICE: Any service that is not residential, as defined by the [Seattle Municipal Code](#).

GROUND ROD: An approved metal rod or pipe placed in the ground to which electric connection can be made in order to maintain earth potential on equipment.

GROUP INSTALLATION: An installation that includes more than one electrical device, such as panels, meters, motors, etc., connected together by a common electric circuit.

GUTTER: See "wiring gutter"

GUYING FACILITY: Cables or braces used to relieve stress on masts and poles.

HANDHOLE: A permanently installed protective enclosure (usually below grade), which is used for gaining access to electrical conductors for the purpose of pulling, splicing, or terminating.

HERTZ (Hz): A unit of frequency equal to one cycle per second; refers to the frequency of alternating current (AC).

HIGH LEG: In a four-wire Delta service, the phase leg that is at higher potential/voltage to ground than the other two-phase legs. Also called the wild leg or the delta leg.

INSTRUMENT TRANSFORMER: Current and/or voltage transformers used in connection with metering and control devices.

JUNCTION BOX: Box, which may be metallic or non-metallic, that has openings in the sides and back and is used to protect and support electrical wire connections or conductor splices.

KCMIL: One thousand circular mils; a measurement of wire size.

KEYBOX: A permanently-installed lock box with keys enclosed. Keyboxes allow City Light personnel to gain access to a customer's premises for the purpose of reading, installing, servicing, or removing City Light system components.

KILOWATT (kW): One thousand watts, a standard measure of demand for power or capacity

KILOWATT HOUR (kWh): The standard unit of measure for electric energy. One kilowatt-hour is one kilowatt of electricity supplied for one hour.

KILOVOLT AMPERE (kVA): A rating that designates the output which a transformer can deliver at rated voltage and frequency without exceeding a specified temperature rise.

LANDING PADS: Hardware upon which current transformers are mounted in the CT can.

LOCKED ROTOR CURRENT: Steady-state current drawn by a motor with the rated voltage and frequency applied and the rotor locked in a stationary position. This is the maximum current the motor will draw.

MANDREL: A tapered, or cylindrical, spindle inserted into, and pulled through the distance of, the installed conduit run for clearing the conduit run of foreign material.

MASTER METER: Any single meter that measures the electrical consumption of all units or subdivisions of a building.

METER SOCKET: A receptacle for the installation of an electric meter.

METER TOTALIZING: See Totalized Metering.

METERING EQUIPMENT: Any equipment used to measure electrical energy.

MOTOR STARTING LIMITATIONS: Limits placed by City Light on maximum starting current of electric motors.

MULTIPLE DWELLING BUILDING: Any building or any portion of the building which contains three or more dwelling units, occupied with provisions for living, sleeping, cooking, and sanitation.

NEC: National Electric Code

NEMA: The National Electrical Manufacturers Association.

NET METERING: A method of crediting customers for electricity that they generate on site in excess of their own electricity consumption. Customers with their own generation offset the electricity they would have purchased from their utility. If such customers generate more than they use in a billing period, their electric meter turns backwards to indicate their net excess generation. Net Metering is available up to 100kW (AC) generating capacity.

NETWORK: A complex underground distribution system that has multiple primary feeds that are connected on the secondary side. Network service areas are designed to provide redundancy and continuity of service in the case of outages and include protective devices to prevent backfeed onto the grid. Network systems exist in downtown Seattle, First Hill, South Lake Union, and the University District.

NEUTRAL: The grounded conductor of a single-phase, 3-wire or 3-phase, 4-wire system. The identified conductor that is at zero potential/voltage to ground.

NON-INDUCTIVE LOAD: An electrical load consisting entirely of resistance.

OVERCURRENT: An overcurrent is a current exceeding the rated current. An overcurrent can be due to overloading a circuit, a fault or a short circuit.

OXIDE INHIBITOR: A compound used to retard oxidation on electrical connections where aluminum conductors are used.

PEDESTAL: A free-standing structure used exclusively to support or contain electrical metering equipment and/or customer service equipment.

POINT OF ATTACHMENT: The point at which City Light's service conductors are attached to a structure by an approved service bracket.

POWER FACTOR: The ratio of true power (kilowatts) to the apparent power (kilovolt-amperes) for any given load and time.

PRIMARY SERVICE: Any service that exceeds the maximum secondary service capacity shown in Table 3.3. These services require transformers or primary metering enclosures to be located in vaults or on pads located on customer's property.

PRIVATE PROPERTY: Land owned in fee-simple title by an individual, individuals, or corporations.

PUBLIC RIGHT-OF -WAY: Land set aside and designated for use by the general public for common access and City Light functions, such as streets, alleys, boulevards, and walkways.

RACEWAY: An enclosed channel for holding wires or cables.

RECLOSER: A complex form of circuit breaker which protects electrical systems from temporary voltage surges and other unfavorable conditions. In addition to preventing electrical overloads from passing through a circuit, reclosers can automatically "reclose" the circuit and restore normal power transmission once the problem is cleared.

RESIDENCE: A single-family dwelling.

SECONDARY SERVICE: Services where the load is served from transformers in the right-of-way or easement areas that meet the requirements defined in Table 3.3.

SERVICE BRACKET: Approved insulators installed by the customer to provide a mechanical termination for the overhead service wires from the City Light distribution system to the customer's structure.

SERVICE CONDUCTORS: Extend from the City Light distribution system to the point of service connection at the customer's property or facility.

SERVICE EASEMENT: A right acquired by City Light to construct, operate, maintain, reconstruct, and alter overhead or underground electric facilities on private property, including property owned by another public agency.

SEAL: A locking device to secure a meter or other service equipment.

SERVICE ENTRANCE CAPACITY: The rating in amperes of the customer's service equipment

SERVICE ENTRANCE EQUIPMENT: Service conduit, conductors, weatherhead, meter socket, and load center.

SERVICE MAST: For overhead service, the conduit above the meter used to provide mechanical protection for the customer's service conductors, and to support the service drop from the City Light distribution system.

SERVICE POLE: A pole necessary to provide adequate clearance and support of the service drop.

SERVICE RATING: The size (in amperes) of the service entrance equipment.

SERVICE STRIKE The overhead point of attachment for City Light's service drop to be attached to the customer's conductors.

SERVICE STUB: An underground conduit to be used in the future to pull conductors to the customer's property.

SHORT PLAT: A short subdivision; a division of land into two to nine lots. See Chapter 23.24 of the Seattle Municipal Code.

SPACE CHECK: In new construction, a field check is performed by City Light to verify that the metering designations assigned by the contractor are correct as to which unit each meter is serving.

SPOT NETWORK: A spot network is a network service composed of three or four primary circuits in a vault that are connected together on the secondary side of the transformers and is not interconnected with a distributed grid outside the vault

STEP-DOWN TRANSFORMER: A device that lowers voltages: the high voltage winding is connected to the input or power source and the low voltage winding to the output or load.

SWITCHGEAR: The switches, fused switches, or circuit breakers used for disconnecting an electrical circuit.

TEMPORARY SERVICE: A customer's service panel energized by City Light on a temporary basis for construction purposes.

THREE-PHASE, FOUR-WIRE SERVICE: Voltage is carried through three conductors 120° out of phase with the other two. Three-phase power provides a more efficient means of supplying large electrical loads like motors. It is used in industrial areas and in large buildings.

TOTALIZED METERING: Totalized Metering (Adjacent or Remote) is the measurement for billing purposes on the appropriate rate, through one meter, of the simultaneous demands and energy of a customer. Totalizing can be permanent or temporary

TRANSFORMER: Referring to a voltage transformer; a stationary device that increases or decreases the voltage in an electrical system, through the use of primary and secondary coils.

TRANSPORTATION AGREEMENT: A legal agreement that is required in cases where City Light cannot access the in-building vault to install and remove its transformers. The building owner assumes the responsibility for moving the transformers.

UNIT LOT SUBDIVISION: Subdivision of land to build townhouses, cottage housing developments, and single-family residences where such uses are permitted. The development as a whole, i.e., the parent lot, meets applicable development standards. As a result of the subdivision, the unit lot developments are allowed to be non-conforming to some developmental standards. See Seattle Municipal Code 23.22.062.

UTILITY: Seattle City Light ("City Light")

VAULT: An approved chamber for electrical equipment. Vaults must meet City Light construction requirements.

VOLTAGE: The pressure behind the flow of electricity, measured in volts.

VOLTAGE FLICKER: The subjective impression of fluctuating luminance caused by voltage fluctuations. It is caused by momentary motor starting currents, switching currents, or by fault current of the distribution system.

WAC: Washington Administrative Code.

WATT: A unit of measure of electric power

WEATHERHEAD: Rain tight conduit fitting installed on the top of the overhead service mast, where the service drop is attached to the service entrance equipment.

WIRING GUTTER: A box with a re- movable face for electrical wires to run through. Wire gutters are used when a single large cable serves several electrical meters. The cable entering the wiring gutter is distributed and connected to the other services. The box is lockable and sealed by City Light.

WIRE TROUGH: A factory fabricated wireway; an open cable wire enclosure in which several cables are housed.

WORKING PLATFORM: A safe, clear, unobstructed floor area with safe access to all electric equipment, protected according to WAC Standard 296-24-75007.

WORKING SPACE: An area free of any obstructions in front of meters, service panels, and electric equipment for providing safe access to install, remove, or repair all electrical devices. A safe working space must meet the requirements of the National and City Electrical Codes.

Appendix: Multi-Unit Metering Pre-Job Checklist

- ☐ **1. Certificate of Occupancy**- Proof of issuance provided to ESR/ESE or consultation with CD Crew chief for approval. **Note:** Only applies to buildings with TTM.
- ☐ **2. Parking** - Adequate parking is available close to the metering location. (SCL Meter Crews need to park for the duration of the work due to the amount of equipment that needs to be transported).
- ☐ **3. Access** - The meter rooms and passage ways are clean and clear of all equipment/debris.
- ☐ **4. Lighting** - Adequate lighting provided by contractor to safely perform the work.
- ☐ **5. Meter Base Labels** - Meter bases shall have engraved phenolic nameplates installed on the cover of the meter socket identifying the final space or unit number, letter designation, and/or street address. *Note: Felt-tip pens and label marker tape are not permanent markings.*
- ☐ **6. Unit Labels**- All units receiving meters shall have at least temporary identification at the main entrance of the space. *Note: It is imperative to notify the Electrical Service Representative/Engineer (ESR/ESE) if the address changes after meter installation.*
- ☐ **7. Panels Safe to Energize** - All unit electrical distribution panels have been approved for service by an electrical code inspector and are safe to energize. *Note: These panels must be energized to perform space checks at the time of meter installation.*
- ☐ **8. Electrical Contractor on Site** - Electricians are available at time of meter install to operate breakers or switches and install/remove panel covers as needed.
- ☐ **9. Access for Space Check** - All units are safe and accessible to perform space checks at the time of meter installation.
- ☐ **10. Key Box Installed** - Note: The key box without a cover will be provided by the ESR/ESE.

Project Address: _____

Print Name: _____ Title: Superintendent

Signature: _____ Date: _____

Print Name: _____ Title: City Light ESR/ESE

Signature: _____ Date: _____
